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Firms' responses to a new environmental regulation: the role of cognitive framing and institutional context

MSc in Innovation and Entrepreneurship

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Abstract

This study contributes to the understanding of how firms respond to a new environmental regulation, and how cognitive framing and institutional context influence firms' responses. Literature on cognitive framing and strategic issue interpretation is combined with institutional theory to develop a theoretical framework, with emphasis on natural resources based incumbents, and a conceptual model is presented. When faced with a new environmental regulation firms may engage, or not engage, in a range of business or political activities depending on how they perceive the regulation, and the overall context in which they operate. Specifically this thesis explores how cognitive framing and perceptions of (i) the environmental regulation itself, (ii) the implementation process and (iii) regulatory uncertainty influence firms' responses. Furthermore, it explores how this interplays with the institutional context in which the firms are embedded.

After developing the theoretical framework, the conceptual model and associated propositions were assessed through a case study of the Norwegian hydropower industry and the Water Framework Directive (WFD) in an early phase of implementation. Using empirical data from five of the largest hydropower producers, combined with a contextual analysis, I explored how the three perceptual regulatory variables and the institutional context influenced HP producers' responses to the WFD.

This thesis contributes to the understanding of firms' responses to a new environmental regulation, by demonstrating the importance of addressing perceptual and contextual variables associated with a new environmental regulation, beyond just the environmental regulation per se. Furthermore, the study offers insight into the moderating role of cognitive framing and institutional context on the environmental regulation - firm response relationship. Implications of the study and suggestion for further research are given.

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Abbreviations

HMWB:	Heavily Modified Water Bodies
HP:	Hydropower
NVE:	Norwegian Water Resources and Energy Directorate
MoE:	Ministry of Environment
MoPE:	Ministry of Petroleum and Energy
WFD:	Water Framework directive

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1 Introduction

Firms are embedded not only in an external business environment, but also a natural ecosystem, and this constitutes a challenge, both for the natural environment and business. Firms can be seen as intermediaries that convert natural resources into usable products (Shrivastava 1995). Thus, firms play a crucial part in reconciling business and environmental activities and in achieving various environmental goals of the society. Environmental concerns have become much more integral parts of many business strategies in recent years as compared with practices 10-15 years ago (Søgaard & Madsen 2007). Moreover, governments and authorities also introduce environmental regulations to address environmental challenges. With tightening environmental regulation in recent years (López-Gamero et al. 2010) firms need to respond, one way or the other, to emerging environmental regulations affecting their industry and activities.

1.1 Statement of the problem

Environmental laws and regulations are implemented to regulate how producers, manufacturers and others businesses should behave in an environmentally responsible manner. Regulation on a general level can be defined as "to include the full range of legal instruments by which governing institutions, at all levels of government, impose obligations or constraints on private sector behavior" (OECD 1997, p. 9). Environmental regulation includes environment-related regulation that both takes into consideration and impacts the environment (Kemp 1998, p. 14).

Environmental regulations are important because, as literature shows, they tend to have an effect on both firms environmental and innovation activities. Yet the literature is not conclusive on the matter. Garrod and Chadwick (1996) discussed the linkage between environmental management and business strategy and found that a shift to environmental concern is more likely in a regulatory context rather than in a voluntarily context. Clemens (1997) concluded that environmental issues are considered to be more important and more institutionalized in industries with extensive environmental regulation. Some scholars find that government regulation is the most significant factor in triggering and endorsing firms' environmental innovation (Porter 1991; Porter & Linde 1995; Doonan et al. 2005). An environmental regulation often exercises a significant force on firms to change their existing technologies and operations, so as to ensure compliance and minimize related environmental costs. On the other hand, several studies also argue the opposite: that the importance of environmental issues at firm level is not related to environmental regulation (Buysse &

Verbeke 2003; Eiadat et al. 2008). Thus, whether environmental regulations lead to more or less innovative environmental activity still remains a debated issue among academia, industry and government.

Furthermore, whereas several studies already have been conducted on impacts of environmental regulations, yet still inconclusive, focus has mostly been on performance and outcomes, less on actual actions and responses of firms (Annandale et al. 2004). Government and authorities introduce environmental regulations with certain intentions. In order to fully comprehend the impacts of environmental regulations, there is a need to further explore and increase the understanding of firms' response patterns to environmental regulation (Annandale et al. 2004).

From a business perspective, Veal and Mouzas (2011) argues that research on firms responses to new regulation is highly relevant since increasing complexity of regulation in many industrial markets provides both significant threats and opportunities to businesses. Environmental regulation may lead (or force) firms to change their existing technologies and operations to ensure compliance, or to exploit related market opportunities. Faced with a new regulation, firms may not merely comply, but can also engage in activities to shape the regulation and the regulatory context to their benefit. An emerging environmental regulation thus produces an incentive for firms to participate in a policy process and/or adjust its business.

Moreover, government and regulators are encouraged to work with firms and stakeholders to define far-future environmental targets (Ashford & Hall 2011). Scholars encourage firms to take an active part in the process of new environmental regulation, both with business-related activities and regulatory-related activities. How firms go about doing this in practical terms and what motivates certain response actions is still yet understudied. Relevant questions to ask are which conditions motivates different responses of firms and what mechanisms are 'working' to influence the responses of firms faced with a new environmental regulation?

1.2 Research objectives and research questions

Based on the assessment above, the objective of this thesis is to contribute to a better understanding of the environmental regulation - firm response relationship through an exploratory theory-oriented study with an empirical part. If we want to understand the regulation-firm response relationship, recent research on regulatory compliance recommends to start with 'the other side', meaning the firm (Parker & Lehamnn Nielsen 2011). Hence, I adopt

this approach and focus on *firms' responses* to environmental regulation. The focus of this study is on firms' responses to a *new environmental regulation* defined as an environmental regulation under early implementation where all the details are not yet settled.

In terms of firms, I confine this mainly to natural resources based industries and large incumbent firms[1] since their relationships to the natural environment are evident. Their activities may have a significant negative effect on the natural environment, whereas their own success or failure in many ways substantially depends on the continued quality of the natural environmental. These firms are therefore in a delicate position. Furthermore, according to Welford and Gouldson (1993), well-established industries and large firms have a special role to play in reconciling environmental and business goals. They portray large incumbent firms as engines of economic development that have financial resources, technological knowledge, and institutional capacity to implement ecological solutions. Natural resources based incumbents may face challenges when new environmental regulations appear, which potentially affect how these resources are utilized. Research has indicated that firms in proximity to sensitive natural areas are likely to be among those most affected by environmental regulation (Carter & White 2012).

Environmental regulations have various degree of stringency (Durant et al. 2004); ranging from command-and-control legislation, which involves the establishment of technology-based standards or emission levels based on existing methods of control, to flexible regulation, which encapsulates a flexible or collaborative approach that relies primarily on market mechanisms and technology identification to solve environmental problems. However, on a more general note, taking the *firm's perspective* a new environmental regulation may be viewed as *a change* in the context in which the firms are operating. Armenakis and Bedeian (1999) found that three dimensions shape the reaction to a change: content (objectives and goals), process and context. I therefore hypothesize that an environmental regulation can be studied along these three dimensions, where the content is the regulation itself, the process is the way the regulation is being implemented and the context is where the firms are operating and the implementation is taking place.

Furthermore, the concept of regulatory uncertainty has emerged in business literature during the recent years, predominantly in the works of Hoffmann (Engau & Hoffmann 2009;

[1] Incumbent is the term used in business and innovation literature to describe established firms in established markets, which is the opposite of entrants or start-ups/entrepreneurs that are new to an industry

Hoffmann et al. 2009; Hoffmann et al. 2008). Hoffmann et al. (2008, p. 714) defined it as "a firm's inability to predict the future state of the regulatory environment". This aspect deserve continuing attention (Scheytt et al. 2006) and particularly in the early phases of a new environmental regulation where several regulatory issues may still not be settled. Thus, an additional component of this thesis is to explore how regulatory uncertainty influences firm responses to a new environmental regulation.

The literature management cognition and cognitive framing holds that it is particularly *how an issue is framed or perceived* that forms how actions take place rather than just the issue itself. Scholars find that cognitive frames and perception largely direct managers' decisions rather than what might objectively be the case (Finkelstein & Hambrick 1996; Marshall et al. 2005). Hence, the element of cognitive framing and perception is one of the main aspects that will be covered in this study. I will address the regulatory dimensions mentioned above through a cognitive lens and how this influences firms' responses to a new environmental regulation.

Furthermore, institutional theory holds that the context matters for both firms' behavior and perceptions. Studying the behavior of firms operating in an industry subject to regulatory change gives rationale for using an institutional theory perspective (Hoffman & Ocasio 2001). Accordingly, the institutional context in which firms are embedded will be considered. Thus, this study also aims to enhance the understanding of how the institutional context influences firms' responses to a new environmental regulation.

Based on the above elaboration, in order to contribute to a better understanding of the environmental regulation-firm response relationship I pose the following research questions to guide this research:

RQ1: How do firms respond to a new environmental regulation relevant for its core business?

RQ2: How does cognitive framing influence the firms' responses to the new environmental regulation?

I will address the role of cognitive framing primarily through perceptions and frames of firm managers and decision-makers. Taken into account the regulatory dimensions assumed to be of importance, the following sub-questions are therefore raised to give insight into RQ2:

> ***RQ2.1:*** How does a firm's perception of the environmental regulation influence its response to the environmental regulation?

RQ2.2: How does a firm's perception of the implementation process influence its response to the environmental regulation?

RQ2.3: How does a firm's perception of regulatory uncertainty influence its response to the environmental regulation?

RQ3: How does the institutional context in which the firms are embedded interplay with the dynamics of firms' perceptions and responses to a new environmental regulation?

The research questions above will be further elaborated in Chapter 2 in the development of the theoretical conceptual framework. An empirical case study, on how hydropower producers within the Norwegian hydropower industry responds to the EU Water Framework Directive (WFD), will be conducted to explore and test the theoretical framework further.

1.3 Structure of the thesis

This thesis consists of six chapters and it is organized as follows. This chapter, Chapter 1, has given the background and research aims. Chapter 2 outlines the theory used and presents the theoretical conceptual framework developed from existing literature. In Chapter 3 the methodology is described. Chapter 4 presents the findings from the empirical case study. In Chapter 5 the findings are discussed and theoretical and managerial implications are given, together with suggestions for further research. In Chapter 6, the final chapter, the overall conclusions are presented.

2 Theoretical framework

In this chapter, the relevant theoretical aspects are presented in order to answer to the research questions posed in the previous chapter. I combine literature on cognitive framing and strategic issue interpretation with institutional theory to explore the environmental regulation-firm response relationship. Literature on business and environmental regulations are reviewed to look into various responses of firms. I first present the overall conceptual model that was derived based on the literature review, before addressing each of the component more in detail in the remaining of the chapter.

2.1 Conceptual model

The focus of this thesis is on firms' responses to a new environmental regulation and how cognitive framing and the institutional context influence these responses. Hence, a firm's response may be considered as the dependent variable and the new environmental regulation as the independent variable. Cognitive framing and the institutional context are moderating variables moderating the regulation-firm response relationship.

As proposed in Chapter1, a new environmental regulation may be considered as a change in the environment of firms and industries, and a change can be studied along the dimensions of content, process and context (Armenakis & Bedeian 1999). In addition, a new environmental regulation may be associated with regulatory uncertainty. Furthermore, cognitive framing literature holds that it is how an issue is *framed* or *perceived* that determines actions. Especially in new situations where the characteristics are not clear enough to dictate action, it is the firms' frames and perceptions and not the "objective" features of the situation that become the basis of choice and action (Finkelstein & Hambrick 1988).

With reference to the elaboration above, it is suggested to address the influence of cognitive framing on firms' responses through firms' (i) perception of the new environmental regulation itself, (ii) perception of the implementation process and (iii) perception of regulatory uncertainty. The assumption is that this will moderate the new environmental regulation-firm response relationship by influencing how firms chose to respond.

Furthermore, firms do not operate in isolation from the context in which they are embedded. Institutional theory stipulates that the context in which the firm is embedded and the environmental regulation is being implemented, will influence both the behavior and the perceptions of the firm (Hoffman & Ocasio 2001).

Two main categories of firms' responses to regulations are emphasized in literature: firms may choose to respond in terms of business (market) or political (non-market) activities. The business and political activities are not mutually exclusive, but interwoven (Kim 2008). Furthermore, faced with a new environmental regulation firms may not just *react*, but can also actively engage to *shape* the regulation (Bagley 2010). The new environmental regulation-firm response relationship is therefor not a one-way relationship.

Consequently, firms may engage in a range of responses (*business and/or political responses, reacting and/or shaping*) depending on how they perceive the environmental regulation and the associated regulatory dimensions, and how this interplays with the overall context in which the firms are embedded. These elements can be presented in a conceptual model as given in Figure 1 below.

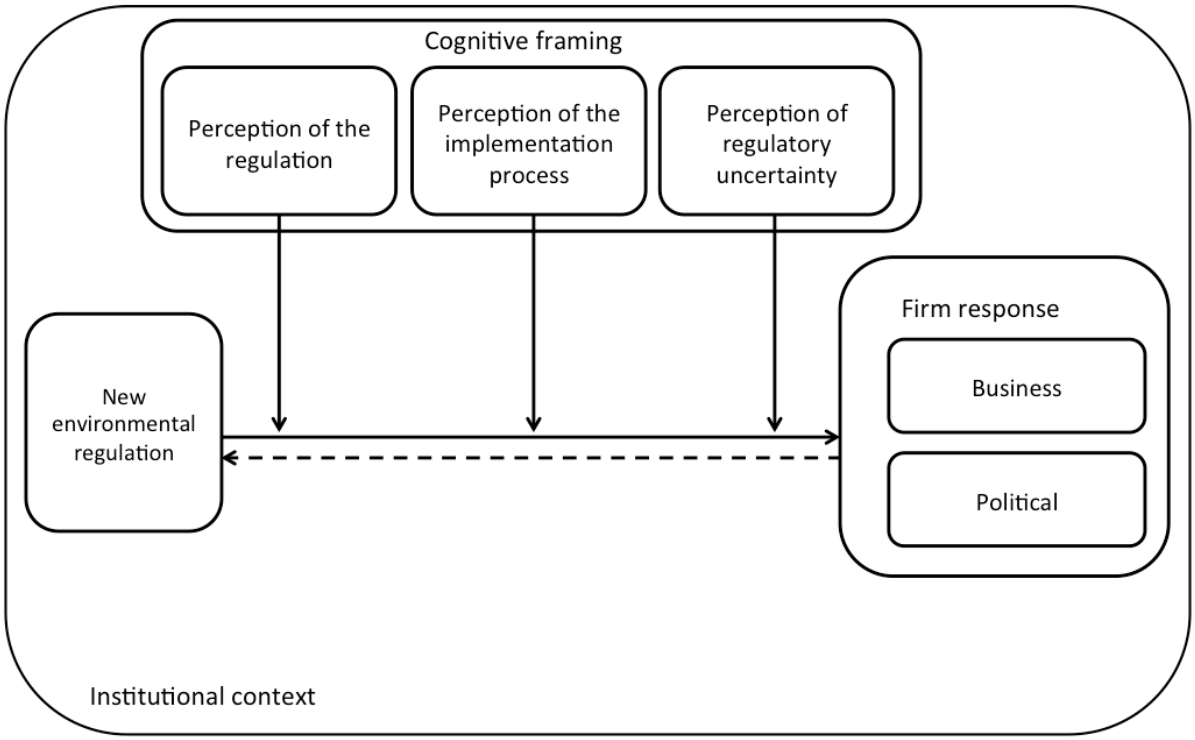

Figure 1 The conceptual model of the new environmental regulation–firm response relationship

Type of industry and type and size of firm is likely to influence firms' responses. Such variables can be considered control variables in the figure above. In this thesis I have confined the focus to large incumbent firms in the natural resources based industries. Furthermore, I consider the industry as a part of the institutional context in which the firms are embedded.

As mentioned in the introduction this study focuses on the "firm-side" of the regulation-firm response relationship. In the following sections each of the main elements: firm responses to a

new environmental regulation, cognitive framing and the institutional context will be addressed more in-depth. The objective is to explore the relationships between the variables further and establish propositions on how firms' responses relate to cognitive framing and perceptions, and how this interplays with the institutional context.

2.2 Firms' responses to a new environmental regulation

In this section I first review the relevant literature on various responses by firms to regulations and environmental issues, with special focus on natural resources based incumbents. Thereafter I establish an overview of relevant responses to a new environmental regulation.

2.2.1 Responses as presented in literature

In the business and regulation literature two main groups of responses strategies occur, namely market (economic) and non-market (political/policy) strategies. As an example, Kolk and Pinkse (2004) divided market strategies and political strategies for climate change, indicating that the former is related to economic responses to tackle climate change by reducing the carbon footprints, whereas the latter focuses on firms activities to shape policy-making. Shaffer (1995) gives an extensive overview of firms' political strategies. Firms that are highly dependent on government are more likely to engage in political action to shape policy (Hansen & Mitchell 2000). Several natural resources based industries are regulated; it can therefore be expected to see evidence of political activity in such industries. Furthermore, literature holds that size does matter: dominant, established firms in concentrated markets are well positioned to shape regulatory environments to their advantage. The assumption is that such firms have greater resources to achieve their regulatory goals through lobbying, funding, research and public relations.

Furthermore, in the literature on regulatory enforcement and firm management, various typologies of organizational responses to the natural environment, e.g. as mentioned byAragón-Correa and Sharma (2003), or to external demands (Oliver 1991) can be found. This literature however has primarily focused on compliance performance rather than behavioral response. Moreover, literature on existing typology of environmental strategies includes a large number of classifications. These are conceptualized on a continuum from non-compliance to over-compliance. More than 50 different typologies or continuum models have been created (Kolk and Mauser (2002) provides a review). Yet, the particular focus of this study is how

firms respond to a new environmental regulation, not the overall general environmental strategies of firms. An underlying assumption is therefore, that even though they may be interlinked, a firm's response behavior towards one specific environmental regulation may be different from the overall environmental strategy of the firm. This also implies that an environmentally proactive company could choose for some reason to respond reactively to a new environmental regulation.

In the literature, several models of environmental strategy provide a framework in which firms' responses are distinguished as "reactive" or "proactive", in which response is defined in terms of the outcomes of strategic reaction. These models are not specifically designed to capture initial responses (in form of behavioral patterns) made by firms to a new environmental regulation (Annandale et al. 2004). Several of these studies, as they are defined, also take the proactive response as the normative better response. An underlying assumption in these models is often that firms (should) improve their environmental performance in a proactive direction (Jeswani et al. 2008, p. 48). There are good reasons to be proactive in many different cases. The way I will use a proactive and reactive distinction in this thesis is, however, on more "neutral" terms and more related to the behavior towards the environmental regulation not the environmental issue per se (even though these of are inter-linked).

Annandale et al. (2004) adopted the model of Buchholz et al. (1994), which focuses on a social and public policy more generally, in a study on how Australian and Canadian mining companies respond to environmental approvals regulation. This model is more flexible and also encapsulates initial responses. See Table 1.

Table 1 Firm's response types to environmental regulation (from Annandale et al. (2004))

Inactive	The issue is of no concern to the company. Refusal to acknowledge that any change in firm behavior is necessary.
Reactive	Negative: The company attempts to obstruct public policy. Stonewalling (responding late to avoid uncertainty) Positive: The company accepts the regulation as legitimate and adapts its behavior accordingly after the event.
Proactive	Rather than fighting change or simply accommodating it, proactive responses by companies attempt to influence change by shaping the external environment or by modifying internal structure and resources
Interactive	Problems are worked out by mutual participation between stakeholders. Success involves negotiation of mutual acceptable outcomes. The companies are just as involved as regulators in searching for solutions to the problem.

If a company presents a "proactive" response, it may decide to either influence the external environment in some way, or to resort to modifying its own internal structure and processes. Based on this model a company representing a "reactive" type will adapt its behavior after the event (when regulatory issues are settled) or may also attempt to stall the regulation (process). According to Marcus (1987) and Buchholz et al. (1994) "opportunism" occurs when responding early to regulation in order to preserve flexibility. "Stonewalling" is defined as responding late to avoid uncertainty. Marcus (1987) notes, however, that in analytical terms a strict division of firm response into these two patterns (opportunism and stonewalling) may lead to ignoring the dynamic features of actual firm response. Firms may use both stonewalling and opportunism simultaneously or move back and forth between the two approaches. "Opportunism" may be seen as a proactive response, whereas "stonewalling" may be seen as a reactive response.

As can be seen from the table above, (Annandale et al. 2004) also denote negative and positive reactive postures towards a regulation (or policy). However, this may not be seen as negative from the company's point of view, as it may be perceived as a "necessary" response. Still, this relates to the *nature* of the specific response.

2.2.2 Type, mode and nature of firm response

The main message taken from the above review is that firm responses can be studied along three main dimensions. Thus, it is possible to distinguish between *type*, *mode*, and *nature* of firm responses, as it will be done in this thesis. These dimensions will be elaborated below.

Type of response: Business and/or political

As already described, the literature tends to separate between two broad *types of responses*: business and political. Faced with a new environmental regulation managers need to determine whether the regulation, which is intended to improve the environment, either conflicts with maintaining industrial performance, or may complement and perhaps even, improve the industrial performance. A way to study *business response* in an early phase to a new environment regulation is to assess if the firms have made any changes in their business in response to the regulation. If the external environment changes, firms may have to decide to change its activities or resources as a response, in order to stay competitive or to comply with regulations. Thus, firms may respond by making no changes (continue business as usual), small incremental changes, or radical changes in its business when faced with a new environmental regulation. Examples of incremental changes could involve adjustment of

internal information routines whilst radical changes, for example for hydropower producers, could be a major transformation of operations of their hydropower plant. Moreover, a firm may make organizational changes internally as part of the response to the regulation that can be both business and politically related.

With reference to the cognitive framing and perception literature, I assume that the change firms make (or not) will be influenced by how the firm perceives the current situation (this will be explored in Section 1.3). This can also be related to whether the environmental regulation is seen as complementary or contradictory to the current practice (Rugman & Verbeke 1998).

Firms may also engage in *political responses*. Literature on firms' political action provides a rather extensive range of various political tactics, such as lobbying, advocacy advertising, constituency building and coalition formation, which firms may undertake in their political environment (Oliver 1991). Thus, such activities would be symbolic of political responses towards a new environmental regulation. Instead of reacting to regulations after they are fully implemented, firms can propose procedures and institutional arrangements that would be favorable to them by engaging in lobbying and other political activities (Bagley 2010). Accordingly, anticipating, understanding, evaluating and responding to public policy developments within the institutional environment is itself a critical task of firms (Bagley 2010). Lobbying is often seen as an activity in which different interests (actors) shape or affect policy, successfully or not (Mahoney 2007). Some scholars on the other hand highlight that lobbying also includes the acquisition of information about how the system works and how "interest-representing actors" can be established as participants in the regulatory process. As a result, they take a more inclusive view. For example, according to (Mazey & Richardson 2001, p. 249): "lobbying is as much about minimizing surprise by being informed, as it is the attempt to influence a policy". This can be highly relevant when faced with a new environmental regulation; firms may engage in lobbying as a way to ensure to be kept informed.

Oliver and Holzinger (2008) assume that successful firms will tend to view political environments as opportunity sets where firms face choices about what objectives to pursue and how to pursue them in a way that best serves the firm. According to Oliver (1991), complying can be defined as, "obeying rules and accepting norms", whereas influencing is: "shaping values and criteria". Compliance strategies are firm-level actions undertaken in conformity with political requirements and expectations, whereas influence strategies are firm-level

actions undertaken for purposes of mobilizing support for the firm's interests. So, are firms "regulatory takers" or "regulatory shapers"? This relates to the mode of response.

Mode of response: proactive vs. reactive

An organization's mode of responsiveness corresponds to its manner of response, rather than the concrete content of the issue addressed. In this thesis *the mode of response* is defined as the way that the firms respond in terms of *reactive* or *proactive* response behavior.

Based on the literature review a *reactive* response is a reaction to the external environment mainly by adapting reactively to occurring events ("answer to what they see"). A *reactive mode* therefore implies that the firms mostly let events and situations related to the environmental regulation set the agenda, the pace and therefore also potential details of the (compliance) actions, by them themselves not taking the initiative beyond what is required according to the process. A *proactive mode* is about shaping the process and outcomes, trying to anticipate potential future aspects. It is about taking action in anticipation of changes that might come, and act before events and situations actually happen or are settled. Companies that take a proactive approach are often trying to capitalize on a potential future opportunity or to avoid a potential future threat. In the context of an environmental regulation it can be assumed that a reactive response is mostly about *compliance* whereas proactive response is about *influence*. I adopt these most common modes: *reactive* and *proactive* as a way to describe the firms' timeliness of responses of the firms to the new environmental regulation. Accordingly, firms may respond to a new environmental regulation with a mix of *proactively* or *reactively business* and/or *political* activities. These activities may also be of a certain *nature*.

Nature of response: supporting, defensive, neutral

In terms of political responses the following *natures of response*s are typically identified: *supportive*, *opposing* (defensive of the status quo) and *neutral* (*reactive*) (Kim 2008).

In terms of business responses, as already described, firms may make *no change*, *incremental changes* or *radical changes* in their business activities in anticipation (proactive) or in compliance (reactive) with a new environmental regulation. These may be seen as supporting or neutral of a regulation; if it is done deliberately to support the regulation, it may be viewed as supporting in nature. Firms may engage in technology demonstrations as a way to (indirectly) support a regulation[2].

[2] I do not consider if firms engage in business activities to obstruct an environmental regulation

Compiled overview of the various dimensions of firm's response

Based on the review of the different dimensions of firm responses an overview as in the table below can be presented.

Table 2 Firm responses to a new environmental regulation

Response	***Mode*: proactive (influence)**	***Mode*: reactive (comply)**	***Nature*: supporting, defensive (opposing) or neutral**
***Type*: business**	Adjust internal resources. Make anticipatory changes in production, business model or similar. Technology demonstration.	Implement according to demands of the regulation after it is settled	Business as usual (no change) Incremental adjustments Radical adjustments
***Type*: political**	Influence policy early for example by lobbing	Respond to hearings Comply/no response	Supporting (Accommodating) Defensive (Opposing) Neutral

Firms may, when faced with a new environmental regulation, adapt their resource base and capabilities by adopting new technologies or developments in order to gain a competitive advantage; engage in development of best practice solutions or technology demonstration that redefine industry standards as inline with the "business response"[3] above and/or engage in political response activities. These types of response activities are not mutually exclusive, but usually interwoven in each other (as describe in the instruction of Section 2.1). Moreover, there may be a myriad of reasons for firms to respond in a particular way, with a particular mix of proactive and reactive political and business activities of a certain nature. It's beyond the scope of this thesis to further explore all of these combinations and motivations.

In terms of taking action Hillman (2003) found that firms with substantial resources are more likely to take an individual political action, whereas resource-poor firms will use a reactive or collective political action. This relates to whether the firms are equipped with resources and capabilities to allow them to influence regulatory authorities and policy-makers. If not, it is difficult to sustain competitive advantages by engaging in political activities. As mentioned earlier, literature typically holds that it is usually the larger incumbent firms that are assumed to have the resources and powers to engage (directly) in substantial political activities.

[3] Business response is assumed to contain environmentally relevant activities

Oliver and Holzinger (2008) found that the various types of firms' political activities are dependent on the firms' capabilities to manage their political environment. Hence, based on the resource-based view, firms would be motivated to either *create* or *maintain* their value in political environments by influencing the policy formation (Oliver & Holzinger 2008). From this perspective, firms would perceive their political environment as a set of possibilities for leveraging firms' strategic assets and competencies to earn economic gains (Schaffer et al. 1995) and not as an institutional constraint on firms (DiMaggio & Powell 1983). Hence, firms differentiate the objectives for their political responses between *maintaining* or protecting firms' value, e.g. lobbying to maintain conditions in favor the firm, and *increasing* firms' value, e.g. influencing public agencies to obtain favorable conditions. This relates to the *nature* of firms proactive responses to a new environmental regulation.

Firms can engage in proactive influence strategies to impede unwanted changes and to protect what the firm views as a favorable status quo (Oliver & Holzinger 2008). Such activities of *a defensive nature* can be anticipated when the new environmental regulation is viewed as conflicting with the business goals of the firm. Thus, firms that mainly intend to *maintain their value* might engage in political responses by actively advocating the status quo (McWilliams et al. 2002). Firm that has plans to move in the direction of what the new environmental regulation stipulates, may engage differently. *Value-creating firms* might make use of the political environment by (i) lobbying for standards that they already can meet, but they anticipate will be harder, or more costly, for competing firms to meet or (ii) by lobbying for a regulation to create a market for their newly developed products or services. Whereas lobbying for higher standards may be characteristic of incumbents trying to block entrants or other competitors, the latter, lobbying for a regulation to create a market, might potentially fit better with third-party technology providers than regulated natural resources based incumbent firms. Nevertheless, such proactive political responses can be seen as being *supportive* of the environmental regulation.

Following the argument above, the resource-based theory of the firm postulates that the responses of firms to regulations are a reflection of their resources and capabilities. This thesis does not go deep into the dynamic capabilities of the firms, however I acknowledge its importance. Furthermore, I would also expect this to be reflected in how firms frame (perceive) the environmental regulation and its contextual factors, which is the main focus of this thesis.

From theory we find that on a general level, how a firm will respond to a change in their external environment is related to how they perceive the issue (which also indirectly is a reflection of their own internal capabilities to deal with the regulation). In the next section I will focus on how cognitive framing may 'work' to modify, amplify or reduce, certain responses of firms to a new environmental regulation.

2.3 Cognitive framing

Research on managerial cognition suggests that a cognitive framing is about the way individuals perceive, filter and conceptualize information (Weick 1995). Cognitive frames are mental representations of a particular aspect of the world used to make sense of stimuli coming from the natural, economic and social environments (Weick 1995).

Frames may be defined, according to Schön and Rein (1994, p. 23), as "underlying structures of belief, perception, and appreciation" through which subsequent interpretation is filtered. Thus, frames are the means by which managers and decision makers make sense of ambiguous information from their environments. These interpretations in turn influence the actions a firm takes (Dutton & Jackson 1987; Jackson & Dutton 1988). Specifically, research also suggests that perceptions of an environmental regulation would have an impact on how companies respond to the regulation (Sanchez 1997). Szulanski et al. (2004) suggest studying cognitive framing as an alternative to individual perceptions as, "there are usually less frames than there are personal opinions". Frames become collectively held within organizations especially through influence of the leader.

Accordingly, an underlying assumption is that cognitive framing influences firm responses to a new environmental regulation, in terms of type of response (business, political), mode (proactive, reactive) and nature (supporting, defensive, neutral). Faced with a new environmental regulation, firms may respond proactively and/or reactively with both business and/or political responses of a certain nature, influenced by how they perceive the environmental regulation. For example if the framing changes or intensifies, this may moderate the response in terms of both type of response and the "timeliness" (mode) of the response. After reviewing common frames I address the influencing role of firms' framing/perception of respectively (i) the environmental regulation, (ii) the implementation process of the environmental regulation and (iii) regulatory uncertainty.

2.3.1 Threat and opportunity frames

Studies demonstrate that the degree to which firm will actively engage or respond to an issue is related to whether the issue is anticipated to have a big impact on the firm or not. Seen from the company's point of view; it first has to become aware of the issue, in this case the environmental regulation, and then interpret it. It is in particularly the work of Jane Dutton in converging cognitive theory and strategic management that has shaped this field of research, which is often referred to as "the strategic issue literature". Strategic issues are defined as developments, events and trends, having the potential to impact an organization's strategy (Dutton & Jackson 1987). The literature on strategic issue interpretation explains processes that determine which events and information that managers pay attention to or ignore. It can be assumed that this also is relevant for environmental regulations.

The two most common frames are *threat* and *opportunity* (Dutton & Jackson 1987; Jackson & Dutton 1988). Managers' intentions are especially driven by to which the extent a given situation is framed as a threat or an opportunity for the firm (Dewald & Bowen 2010). It should be noted that, according to literature, more specific frames might occur where firms, groups, or the industry themselves construct a frame that is not explicitly stated as an opportunity or threat, for example, "business unit task" or "political activity". Such framings may also have implications for the response to an issue, as it for example may create a sense of irrelevance to certain groups or actors. While frames can exist around all aspects of a firm's activities and environment, for the purposes of this thesis, I focus on the frames about whether the new environmental regulation and the associated regulatory dimensions are perceived as threats or opportunities.

2.3.2 Responding to threats and opportunities

Both threats and opportunities imply a sense of urgency and difficulty and are accordingly likely to evoke an organizational action (George et al. 2006; Jackson & Dutton 1988). There are various and opposing views within literature on how this will actually influence firm behavior.

The strategic issue literature has, in particular, focused on the effects of perception of threat or threat framing (Jackson & Dutton 1988; Dutton & Jackson 1987). This literature holds that the notion of a threat produces constricted domain definition and rigidity among individuals in organizations (Staw et al. 1981). In response to a threat, firms, groups, and individuals often respond in rigid, habitual ways. Jackson and Dutton (1988) argue that threat motivates

behavior around controllable resources, which in turn, limits the discovery of alternatives. The combined result of these behaviors is described as the "threat rigidity" phenomenon. Thus, if a new environmental regulation is interpreted as a threat, it may inhibit managers from establishing more proactive business responses, potentially involving innovation, to the regulation. Under the conditions of threats, response to environmental regulation is likely to be resistance and rigidity (Marcus & Goodman 1986). It may also be assumed that a group of firms in the same industry, that frame the environmental regulation as a threat to their business, will be involved in group formation or "herd behavior" in order to protect their status quo.

On the other hand, creating a sense of threat may function as an effective catalyst (Kotter 1996) to trigger response. This is related to creating a sense of urgency. It is actually found that there is more willingness to commit resources to an issue when it is perceived as a threat. As a result, it can be assumed that firms that perceive a new environmental regulation as a threat to the core business will allocate time and resources to the issue. This may create the picture that when an issue is framed as an opportunity, commitment may be low and the business will not develop, as opposed to when a threat framing is dominant. Yet, the response influenced by a threat framing would most likely involve activities to defend business as usual. Theory is not conclusive on this matter. Theory mostly holds that the framing of opportunity or threat needs to be of a certain level to trigger action.

If a new environmental regulation is framed as an opportunity, a different dynamics could be assumed. Seeing a regulation as an opportunity can help managers to anticipate new business standards even before they are enforced or enacted into regulation. Such anticipation could have positive benefit for competitiveness of the firm (Marcus & Goodman 1986). Firms in industries that are quite substantially regulated may however have possibly limited "freedom to operate outside the set boundaries", but could for example use the opportunity to positively and proactively influence the regulatory process with supportive knowledge (that also benefits the business).

Opportunity framing has been found to result in more open searches for solutions, as compared to framing issues as threats (Nutt 1984). Thus, activities that involve active search and scanning solutions (in anticipation of change) may be potentially related to (and benefit from) perceived opportunities. Literature also suggests that opportunity framing is fostering willingness to adopt disruptive business model innovations (Charitou & Markides 2003).

2.3.3 Perception of the environmental regulation

In what way is such framing evident in the light of a new environmental regulation? Based on the various typologies explored there should be basis for assuming that if a firm perceives the environmental regulation as a significant opportunity they would make strategic changes and/or initiate and engage in development and innovation activities as response to the regulation. Since the firms of this study is confined to incumbents, literature do however also shows that large incumbent firms have a history of being slow in adapting to change.

Furthermore, some managers will distinguish between threat by external factors and the firm opportunity available through adoption of new innovative ways, as a firm of response (Gilbert 2003; Dewald & Bowen 2010). Basing on this, we can assume that a firm, through its managers and decision makers, can perceive an external issue that might pose a threat to the industry as such, as an opportunity to the company. From the review above, the following propositions can be put forward:

P1: A new environmental regulation *framed as a threat* will positively influence proactive political response of a defensive nature and a reactive business response, depending on the degree of perceived treat. That is, with a high degree of perceived threat firms are more likely to:

a) adopt proactive political responses of a defensive nature with resistance towards changing status quo

a) respond reactively in terms of business response (wait-and see, comply).

P2: A new environmental regulation *framed as an opportunity* will positively influence proactive business response behavior and a proactive political response of a supportive nature, depending on degree of perceived opportunity. That is, with a high degree of perceived opportunity firms are more likely to:

b) respond proactively in terms of business response of a radical nature (or incremental nature), depending on current level of development

c) adopt proactive political responses of supportive nature

There may also be situations where a firm engages in a business response but not political response or the other way around, so P2.a and P2.b do not necessarily occur together.

Analyzing the perceptions of a new environmental regulation of several firms within one industry might shed light on this issue. It may provide an increased understanding of if potential differences in responses towards one specific environmental regulation may be attributed to differences in perceptions of the regulation and the regulatory context.

2.3.4 Perception of the implementation process

In the previous sections, the implementation process of an environmental regulation was proposed as an important dimension that may shape firm responses to a new environmental regulation. Gerard and Lave (2007) studied two technology-forcing policies and found that the implementation process was crucial for how the regulations affected the development of new technologies within firms. They discovered that it was the political and regulatory variables influencing the implementation process that were the most important, rather than the complexity or costs of adopting the technologies. The understanding of implementation requires the recognition that it is a process involving multiple actors and in most cases involves multiple organizations (O'Toole et al. 2010). Practical implementation of an environmental regulation consists of the actions of actors involved in the process and the results of these actions. Several policy implementation studies do exist (Schofield 2001), but less studies can be found at firm level as to how firms' framing or *perception of the implementation process* influence their response to the environmental regulation. This is still an understudied topic.

A firm's perception on how the new environmental regulation is being implemented by the regulatory authorities and other relevant actors is assumed to be a potential influencing variable on firms' response behavior. Threat and opportunity framing is about gains/losses and also controllability. It may be assumed that the perceptions related to the implementation process of a new environmental regulation are in particularly related to the control aspect. Issues that firms' managers perceive as threats are often characterized by low controllability, i.e. low control of source and effect (Jackson & Dutton 1988). Thus, the following proposition can be made about the implementation process of a new environmental regulation:

P3: An implementation process, *framed as a threat*, will influence a firm's *proactive* political response of a defensive nature positively and a firms reactive business response positively. That is, firms perceiving the implementation process as a threat, or with a high level of unsatisfactory to the firm, are more likely to:

a) engage proactively in political responses of a defensive nature to "protect the level of control"

b) apply reactive "wait-and see" business responses to reduce risk

P4: An implementation process, *framed as an opportunity*, will influence a firm's political response of a supportive nature positively and proactive business response positively, depending on the level of perceived opportunity. That is, firms perceiving the implementation process as an opportunity, or beneficial to the firm, are more likely to:

a) engage proactively in political responses of a supportive nature to leverage business opportunities or "control the process"

b) apply proactive business responses (with anticipated support of the implementation process)

2.3.5 Perception of regulatory uncertainty

When studying responses to a new environmental regulation, where issues are still to be settled, the concept of regulatory uncertainty becomes particularly relevant. As mentioned earlier, regulatory uncertainty is defined as "a firm's inability to predict the future state of the regulatory environment" (Hoffmann et al. 2008, p. 714). Same as with the implementation process in general, the regulatory uncertainty is also connected with the actions of the agencies that create and enforce the regulations (Hoffmann et al. 2008).

Regulatory uncertainty is distinct from other uncertainties mainly due to its dependence on political negotiation, and its discontinuous resolution (Engau & Hoffmann 2009). By the latter, it is meant that it can vary in time, in which it may be higher or lower in various phases of a regulatory process connected with an environmental regulation. Hoffmann et al. (2008) state that certain characteristics of a regulatory uncertainty are of importance including: the basic direction, measures and rules, implementation process, as well as inter-dependence with other regulations. These characteristics are explained in Table 3 below.

Hoffmann et al. (2008) is consistent with scholars who advise to focus on the notion of perception, which in this case means the manager's or key personnel's perception of regulatory uncertainty. The rational is that the regulatory uncertainty will not influence firms' decisions or responses if it is not perceived to be important by its executives.

Table 3 Overview of assets with an environmental regulation as categories for regulatory uncertainty (after Hoffmann 2008)

Assets of regulatory uncertainty of an environmental regulation	Definition
Basic direction	The "basic direction" of a regulation refers to a defined target state as well as a broad agreement on how to reach the target taking into account the political consensus on the basis of objective and subjective arguments.
Measures and rules	The "measures and rules" of a regulation refer to the operationalization of the basic direction of the regulation.
Implementation process	The "implementation process" of a regulation refers to the execution of actions to put the defined measures and rules of the regulation into practice.
Interdependence	The "interdependence" of a regulation with other regulations refers to the extent to which the functioning of the new regulation depends on other already existing or upcoming regulations and vice versa.

In any of the categories in the table above, the perceived regulatory uncertainty may influence firms' overall response to a new environmental regulation. As an example, uncertainties regarding the basic direction of the regulation may inhibit planning reliability about investment decisions: if companies have no clear view on the overall basic goal or target state to be reached. For the further assessment, I address the issue of regulatory uncertainty on the overall level and not by making separate propositions for the various assets given in the table above, but that could be done for a later study.

Uncertainty in a firm's regulatory environment is especially likely to be perceived as a threat (Miller 1992; Boynton et al. 1993) Boynton et al. 1993). The higher degree of threat a firm perceives from regulatory uncertainty, the more the firm tends to pursue an active response that enables it to reduce or adapt to this uncertainty (Jackson & Dutton 1988; Jackson et al. 1987; Dutton & Jackson 1987). Firms perceiving only a low level of regulatory uncertainty are less likely to engage in activities to reduce it, as there will be always a certain amount of residual uncertainty, since regulatory uncertainty cannot be entirely eliminated (Hoffmann et al. 2008). Therefore higher levels of regulatory uncertainty lead to a more active level of response. Thus, the degree of regulatory uncertainty perceived, and the interpretation of this uncertainty as a threat, can be assumed to be an important influencing factor on how firms respond to a new environmental regulation. From this we can hypothesize that the perception of regulatory uncertainty (as a threat) influences the firm to a more proactive political response.

Furthermore, it can be anticipated to cause a more reactive business response. This leads to the following propositions:

P5: A high level of regulatory uncertainty, *framed as a threat*, will influence a firm's proactive political response of a defensive nature positively and a reactive business response positively. That is, firms perceiving a high level of regulatory uncertainty framed as a threat are expected to:

a) engage proactively in political responses to reduce this uncertainty to alleviate anticipated negative effect, "protecting the level of control"

b) apply reactive "wait-and see" business responses to reduce risk

P6: Firms perceiving only a low level of regulatory uncertainty are less likely to engage in activities to reduce it. That is, a perceived low level of regulatory uncertainty framed as a treat is expected to have a neutral (no) influence on firms' responses to a new environmental regulation.

2.4 Institutional context

Institutional theory is one of the oldest within management, and it offers the possibility to explain different responses taken by firms, and more specifically how these are influenced by external contextual factors. Several studies have looked at factors outside the firm, such as levels of industry profitability, competition, and concentration on how this influences firm behavior. Both the resource-based and industry-based view of the firm has tended to see the institutional environment mainly as "background". Lounsbury and Hirsch (2010) emphasize "the crucial role" of institutions in shaping how markets and organizations function. Nevertheless, the acknowledgement "that institutions matter" has been extensively researched the last decades and is not a new or controversial view (e.g. (Oliver 1991; Scott 1995).

What is interesting for this study is how the institutional context and institutions matter in firms' responses to a new environmental regulation. The institutional context, in which the firms are embedded, is broadly defined as "including the rules and belief systems, as well as the relational networks, which arise in the broader social context" (Scott 2001).

Within the institutional context there are institutional forces influencing firms' actions through a variety of processes. Scott (1995) developed the most well known typology in which he introduces the cognitive, normative, and regulative "pillars" of the institutional structure.

Consequently, institutional forces may be defined as a pressure on firms' decision-making coming from either the regulatory, normative, or cognitive institutional forces (Scott 2001). Firms can respond to these institutional pressures by adopting different sets of practices. Furthermore, these forces may come into play at various levels, e.g. national level, industry level and firm level, and shape how both firms and other actors in the social context behave. According to classical institutional theory, regional variations or heterogeneity of firms environmental management practices may be explained by differences of pressures that firms face (González-Benito & González-Benito 2006).

The *regulative pillar* of Scott's typology concerns regulative forces like rules, laws and sanctions that exert coercive power. On the firm level, regulative forces are associated with specific regulations. Thus, a new environmental regulation may be seen as a regulative institution. Regulatory pressure results from regulating agencies such as government that influences a firm by implying the need to comply with laws and regulations (DiMaggio 1988; DiMaggio & Powell 1983). The *normative pillar* concerns normative forces and includes values and norms that influence firms' response. Normative forces relate to formal and informal pressures exercised by other organizations in the field (DiMaggio & Powell 1991). Normative institutions also refer to the values and prescriptions provided and monitored by "intermediaries" such as professional associations. The *cultural-cognitive*[4] *pillar* comprises forces that highlight shared conceptions and a common frame of reference impacting firm responses. The cognitive institutions are the taken-for-granted mental maps (i.e., "logics") through which the social world is understood and reproduced. Cultural-cognitive forces imply that firms' model their actions after similar organizations in the same field that they perceive to be successful or legitimate. Also, firms may choose to imitate the practices by others to reduce environmental uncertainty and to conform to social expectations. This process of homogenization is called "mimetic isomorphism" by DiMaggio and Powell (1983). Legitimacy is thus a central principle of classic institutional theory, which holds that firms merely engage in actions that are legitimate within the prevailing institutional context. Accordingly, adoption of certain policies may increase a firm's legitimacy to operate by external actors and/or stakeholders (DiMaggio & Powell 1983). Furthermore, according to this perspective, industry norms and shared "judgments" pushes behavior of firms within an industry towards homogenization to make companies more alike (organizational isomorphism).

[4] Scott updated the cognitive pillar to cultural-cognitive pillar in his later work after 1995

Traditionally, compliance with laws and regulations has been seen as an ending point for firms' social and environmental obligation. However, this picture is now becoming more diverse. Gunningham et al. (2004) introduced the concept of a "social license". A social license is not only based on compliance with legal requirements, but is rather based upon the degree to which a firm and its activities are accepted by local communities, groups and the wider society. In a study of the pulp industry in US they found that many pulp mill officers emphasized the importance of their "social license" or "license to operate". This illustrates that there may be additional dimensions associated with the responding to an environmental regulation, and it could be related to the normative pillar of the institutional theory and multiple pressures working in the institutional context.

Several scholars, including Scott in his later work and Hirsch (1997), argue that the various institutions comprise all three aspects: regulative, normative, and cultural-cognitive. They also state that even though one aspect may be dominant at any given time, the three coexist and are inter-connected. The forces can reinforce each other, even despite the fact that the forces may not all have a similar influence on firms' perception and behavior. We can therefore assume that there are multiple inter-related pressures working on the firm, in addition to the environmental regulation itself. Hence, firms are embedded within a regulatory, normative and cultural context that shapes social behavior. This indicates that attempts to understand firms' responses to a new environmental regulation also should incorporate "the rich cultural and relational embeddedness of actors and practices" (Lounsbury & Hirsch 2010, p. 7).

When analyzing the environmental regulation (the regulative institutional pillar) from the firm's point of view, it may be seen as maximizing benefits, e.g. answering to the question: "What are our interests in this situation?" This is much inline with the discussion in the previous sections of the new environmental regulation framed as a threat of opportunity. The normative aspect, on the other hand, primarily addresses what the firm is supposed to do: "What is expected of us given our role?" This therefore adds an aspect of legitimacy to firms' response behavior and may lead firms to also choose to comply with environmental regulations from a normative perspective. The cultural-cognitive pillar adds the dimension that instead of just acting under regulation or based on obligation(s), may cause one act because of conceptions; that is basically that one perceives no (relevant) alternatives. As Scott (2001, p. 57) puts it: "Compliance occurs in many circumstances because other types of behavior are inconceivable; routines are followed because they are taken for granted as 'the way we do these things' ".

With reference to the previous section on cognitive framing, some scholars also argue that institutions influence the micro-level cognition (Kaplan & Tripsas 2003). Both firms and other actors look to a variety of institutions for signals when interpreting and acting upon an issue. This can often operate in a reinforcing cycle between micro-level individual cognition and institutionalization of shared cognition at the macro-level (Van de Ven & Garud 1994), which relates to the cognitive pillar of institutional theory. In this respect, intermediaries or mediums for exchange of knowledge may come to play an important role, as they may work to establish a common frame. By addressing also the aspect of cognitive framing, room is given within the institutionalized context for adaption and change. The role of institutional context should therefore explicitly be considered in research on how frames are formed and how institutional context triggers and edit cognitive frames. A key message is that the institutional context, according to Levy and Egan (2003) and others, shape firms' perceptions and interpretations of regulatory constraints, technological and market potential, firm-specific capabilities, and other factors.

With regards to the "importance" of the institutional context in shaping firms responses and perceptions of a new environmental regulation, this may vary with the dynamics of the context and the issue in question. The government, industrial associations and other social actors exert pressure on the companies for conformity based on what they reckoned assert to be acceptable actions. However, regulatory agencies differ in their intensity of efforts and methods to induce actions to address the environmental problems also on specific regulations. The types of actions that industry associations and environmental groups undertake and the strength of their efforts also vary. Furthermore, there is a substantial difference between what is perceived as friendly assistance and what is seen as force. Based on this, Gunningham et al. (2004) proposed the following hypothesis: "The importance of regulatory context will vary according to the degree of activism and the tone of the actions of relevant actors". We may assume that in presence of several different strong interests, the regulatory context may become quite important for how firms respond to a new environmental regulation.

It may be anticipated that large incumbents in natural resources based industries are particularly prone to such social pressures. Firms with high brand equity are often held to higher standards for social and environmental responsibility (Greenwood & Hinings 1996). Furthermore, since natural resources are common-pool resources and environmental issues also are of social concern, considerable stakeholder pressure on such firms may be expected. Additionally, for firms in monopolies or firms without direct customer contact there are

indications in literature that they much deal with negotiations between political interest groups rather than competition for customers in the market place. This may also be the case for natural resources based industry, like forestry, pulp and hydropower producers.

Neo-institutional theory, in contrast to old institutionalism, is based on the notion that the institutional context may be subject to change (Greenwood & Hinings 1996). Moreover, in neo-institutional theory, the concept of agency and actors that initiate changes contributing to transforming existing or creating new institutions has become more prevalent (DiMaggio 1988). This emphasizes that firms may also shape the context they are part of, rather than just being subjected to pressures. This relates in particular to actors' proactive policy strategies and how actors contribute to change in their institutional environment. Linking this to the framing discussion in the previous section, we might anticipate that firms would engage in "working for institutional change" if they see this relevant and beneficial from their standing (opportunity framing). Furthermore, this indicates that institutions are intricately woven into framing.

Based on the review above, a general proposition can be stated:

P7: The institutional context in which the firms are embedded, including institutions and their effects, influences the overall dynamics of cognitive framing, perceptions and responses by firms to a new environmental regulation and the interplay between these variables.

Thus, I conclude this section that the institutional context, including institutions and their effects, requires an explicit incorporation into the understanding of firms' responses to a new environmental regulation.

3 Research design and methodology

This chapter explains the research design and methodology for the study. This thesis is a exploratory theory-oriented research, involving a literature review of the current literature on business and environmental regulation, supplemented by an empirical case study.

Firstly, a theoretical framework was developed by reviewing existing academic literature and deriving an overarching theoretical framework including a conceptual model and associated propositions. This was presented in the previous chapter. Secondly, in order to further explore this framework and firms' responses to a new environmental regulation and how cognitive framing and the institutional context influence these responses, a case study methodology was used. The remaining part of this chapter provides a description of the reasoning for a case study, the data collection and the data analysis.

Since this study concerns responses to a *new* environmental regulation and the focus industries and firms of the theoretical part was natural resources based large incumbents, and, these were selection criteria for the case study. Exploring the Norwegian hydropower producers' responses to the EU Water Framework Directive (2000/60/EC WFD), which is in an early phase of implementation in Norway, was therefore chosen. Furthermore, since the WFD implementation process is on-going for several years to come, it would also allow for follow-up studies of development over time.

3.1 Case study approach

A case study involves "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence" (Yin 2009). An exploratory case study is a particularly useful tool to explore complex causal links in real-life situations (Yin 2009). Furthermore, according to Yin (2009), case studies are good to answer "how" and "why" types of questions. The applicability of a case study when the focus of the research is on contemporary events is also supported by George and Bennett (2005). All of the underlying research questions for the theoretical framework presented in Chapter 2 are the "how" questions.

The firms in this thesis were confined to natural resources based incumbents and the empirical concerned a study of Norwegian hydropower producers' responses to the WFD. Hence, the empirical study intended to answer to how firms within one industry, currently respond to a new environmental regulation and how this is shaped by the cognitive framing and the

institutional context in which the firms are situated. Scholars find that investigating business responses to new environmental regulation, as a contemporary phenomenon in its real life context, is best achieved through the case study research method (Veal & Mouzas 2011).

A typical case study approach would be to use the company as the main unit of analysis. However, taking only the company as the unit of analysis would not answer the main purpose of this study, namely to contribute to increased understanding of firms responses to a new environmental regulation and how cognitive framing or perceptions of regulatory variables influences firms responses and how this interplays with the institutional context. The overall aim of the case study was to explore and test the study propositions developed as part of the theoretical framework (presented in Chapter 2). Accordingly, it was the established variables from the theoretical framework that were investigated through the case study: (i) firms responses to the environmental regulation, in terms of their type, mode and nature, and (ii) firms perceptions of the regulation, regulatory process and regulatory uncertainty and (iii) the institutional context in which the firms are embedded and the implementation of the regulation takes place.

Yin (2009) points out that it is important to set up the boundaries of a case, both in terms of which actors are part of the case and which time frame the study covers. This study mainly looks at the time period of observation from January 2011- December 2012, from the hydropower industry perspective. The main focus was to capture as much as possible on the perceptions and activities regarding the WFD at current. Even though the WFD already had been introduced into Norway in 2007, it was assumed, based on initial talks with the industry in early 2011, that it is was first at this time that the work with issues related to hydropower is coming to fruition. Accordingly, no distinction in this study was made with regards to the separation into phases of the WFD implementation. Time is however acknowledged as a variable that might play a role in how things develop, and also how the industry and firm perceives and responds to the environmental regulation. For this study, however, the case study was primarily used to explore and test the theoretical framework developed by capturing the responses and perceptions in its current state, with some historical perspectives where deemed necessary. With regards to the contextual analysis of the institutional context, with focus on the hydropower industry and the WFD implementation, this was also mainly conducted for the same time period, with some retrospect and some more emphasis on details on the latest developments since the dynamics in the context progressed towards the end of the study period.

3.2 Selection of the case companies

The companies included in the case study were selected among the top ten largest hydropower producers in Norway (in terms of produced hydropower) and finally, the five largest producers were selected. The rationale for this was based both on theoretical and practical reasons. Following from theory, incumbent and entrant firms have a rather different dynamics, and incumbents were chosen as focal point for this study, as stated in the introduction. Moreover, from a practical point of view, I was informed during the early pre-investigations, when talking to industry experts, that it was probably only the eight-ten largest hydropower companies that were at all actively involved in the WFD process at this stage (a finding in itself). Subsequently, the five companies that where included in the case study were: Statkraft, EC-O Hydropower, Agder Energy Production, BKK and Lyse Production. It should be noted that even among the largest companies in the Norwegian hydropower industry, there are also quite large variations in terms of size among them.

3.3 Data collection

Typically, the case studies draw on multiple sources of evidence. This was also done for this study, using semi-structured interviews of the companies as the primary data source. However, triangulation with multiple means of data collection was conducted in order to increase validity (Yin 2009).

Data collection was extended by performing interviews outside the case companies. Interviews were carried out with the relevant industry association to get ascertain the overall industry view. The regulatory bodies were also utilized in order to gain insight into understanding the contextual issues regarding the WFD implementation. Additionally, informal interviews or conversations with other researchers working with the industry or WFD were consulted, as part of gaining further insight and interpreting the results. Thus, the types of informants for this study can be categorized as (the) industry (the HP producers and the industry association), public servants (regulatory bodies) and academia/research (see appendix A for list of interviews).

This study relied on the interviews as one of the main sources of data concerning the firms' perceptions and responses to the WFD, together with the archival data serving as important triangulation and supplementary sources for understanding discrepancies among informants and gaining additional perspectives on key issues. Since focus is on firms' responses, business

and political, it can be seen as critical to collect effective data that shows firms' actual actions in order to secure validity and reliability of the study. Self-reported account of activities involves some challenges in gaining firms' divergent responses. The reasons for using self-reporting by firms on response activities to the WFD was that little data was available at the time of study in any of the firm's annual reports available online (a finding in itself). Furthermore, some of the information may be of such character that it would not be published or shared in public sources. Since the main purpose of the case study was to add empirical support the theoretical framework, and not as full-bodied case study of the WFD and the HP industry *per se*, this was considered an expectable 'flaw' at this time. For the contextual analysis the interviews, observations and archival data was used.

3.3.1 Semi-structured interviews

Semi-structured interviews are useful because the interviewer has greater flexibility compared with structured interviews to introduce new questions and further probe an issue according to the respondents' answers (Wilson 2010, p. 147). Yet, at the same time this approach assists in assuring that certain topics are covered.

All in all, 18 interviews were conducted for this study (See appendix B for list of interviews). The primary interviews and the industry interviews were conducted in April and May 2011. The aim was to explore: the experience of the WFD at the level of the firm and responses taken, and to capture their perception of both the WFD and contextual issues. The respondents were encouraged to tell in their own words and express their personal opinions about the issues. The interviews with public servants and academics/researchers were conducted during September-October 2011. Additional conversations were conducted with industry representatives, regulatory authorities and researchers during 2012 as part of seminars or conferences.

Relevant interview objects within the hydropower companies were considered to be managers and people responsible for environmental and operational activities. Hence, an assumption in the design of the case study was that insight into how these key persons perceive and work with the WFD process would provide relevant data. Within each of the companies, interviews with 2-3 people were conducted, except for one company where only 1 interview was conducted (this person held double roles).

As part of setting up the interviews, an email was sent to the respondents in advance with an explanation of the project and brief overview of issues that were going to be discussed. All contacted respondents answered positively and arrangements for interview were made either via phone or email.

The interviews were primarily conducted face-to-face at the office of the interviewees, which involved travelling to their locations. This was done in order to facilitate the dialogue and gain as much insight into the perceptions and views of the interviewees as possible. The face-to-face interviews lasted between 45 minutes and 2 hours. In cases where face-to-face interviews were not possible, phone-interviews were conducted. The phone interviews lasted about approximately 25 minutes. The interviews were accompanied with brief notes taken during the interview process.

All interviews were conducted in Norwegian, as both the interviewees and the interviewer had Norwegian as their primary language. This was found to create the best setting for the interviews. Furthermore, it increase validity of the informants as they were speaking in their mother tongue and in that way eliminated the problem of linguistic disadvantage (Marschan-Piekkari & Welch 2004).

The nature of the issue addressed in this research, of responding to a new environmental regulation, might be deemed to be sensitive since the topic in some way is related to strategy and issues of value and beliefs. Thus, due care was exercised to conduct the company interviews in such a way as to approach the topic to gain the most valuable information for the research. During the interviews a "laddering questioning technique" was deployed. This is a technique used in semi-structured interviews that helps "understand the way in which the informant sees the world" (Reynolds & Gutman 1988). In general this means beginning with a simple question, and then following up with questions about that response. This is also some of the strengths of using semi-structured interviews. For some elements, not all interviewees felt that they have had enough background to elaborate. The exact issues were therefore adjusted according to the roles and experiences of the interviewee. More than one interview was conducted for the majority of the included companies, which enabled relative cohesion/fairness in regards to the issues covered for all the respondents.

In order to allow all the respondents to speak freely and to ensure anonymity, it was agreed to not use any names in the written work and quotes to be kept anonymous. Since the main point of the study was not an in-depth analysis of the case companies *per se*, for the major part also

company names (or numbering) is omitted order to avoid profiling of individual companies. This is inline with approach of Hoffmann et al. (2009) in their study regarding companies responses to regulatory uncertainty.

Due to analytical complexity, it was assessed as valuable to formulate interview questions to reflect the components in the proposed theoretical framework. This allowed to analyze the collected data and to break it down into topics and into relation to the theoretical issues, both within single interviews and across the entire set of interviews (See Annex A for interview guide). At the time of the company interviews, spring 2011, the full theoretical framework had not been fully developed yet. However, the major theoretical components had been identified.

All the company interviews were recorded and notes were taken during the interviews. For the other interviews, some were tape-recorded others not, depending on the location and setting of the interviews. If recorded, this was always agreed upfront. The recordings were accessible only to the researcher.

3.3.2 Documents

To support the findings from the interviews, documents were also viewed. Annual reports and hearing notes represent, what we may call, official views of the companies. This material was used as support to the information gathered through the interviews. Looking in to the documents, mainly the annual reports of the companies[5] and hearing notes, I was looking for evidence of response and views connected with the WFD, or lack of there of. Furthermore, I paid attention to mentioning of environmental regulatory issues in general, whilst also looking for wordings about regulations in terms of particular of threats or opportunities. For the contextual analysis relevant recent academic reports on the Norwegian hydropower industry and WFD were used, in addition to the interviews, observations and other archival data like hearing notes and information on the website of the industry association Energy Norway.

3.3.3 Observations

Non-participatory unstructured observations (Wilson 2010) were carried out during the study; during the interviews and participation in relevant conferences and seminars. These observations were accompanied with notes. Observing interviewees' and actors' interest and reaction to WFD related issues, and how they framed the discussions, added to the overall data material for this study.

[5] those that were available online

3.4 Data analysis

According to Yin (2009), every investigation should have a general analytic strategy, to guide decision regarding as to what will be analyzed and why. In general, an analysis will rely on the theoretical propositions that led to a case study or, if theoretical propositions are not present, the researcher could consider developing a descriptive framework around which the case study is organized (Yin 2009). In this study, a combination of these two analytical strategies was used utilized (as presented in Chapter 2).

Evidence was gathered within the relevant themes, and then analyzed and compared, in order answer each research question in this thesis. In terms of analyzing the data material, the recorded interviews with the industry were transcribed. The main reason for transcribing the interviews was the acknowledgment of the importance to capture the exact wording of the interviewees, as part of an additional component of capturing their perceptions. The transcribed interviews were analyzed according to the variables in this study. The findings in terms of responses were corroborated from multiple sources of evidence.

Analysis of the wordings or phrasing by the interviewees has been based on the Norwegian transcripts. Where quotes are given in this thesis, these have been translated to English. For reliability reasons, with the risk of some of the meaning is lost in translation, some of the original (anonymous) quotes are included in the appendix C for reference. This gives scholars and others interested the possibility to evaluate the original illustrative quotes directly.

3.5 Data reliability and validity

The rigor and quality of the empirical study are based on its validity and reliability (Yin 2009). Different data sources and collection methods were applied to increase confidence in the interpretation and conclusions in this thesis.

Multiple individuals were questioned on overlapping topics. As far as possible, several persons within one firm were interviewed, which allowed for both a within- firm and across-firm comparison during the analysis for corroboration of results. Triangulation of data was achieved through comparison of empirical findings gained in different groups and through different data sources (Yin 2009).

While companies and the managers and decision-makers within the companies, were the main unit of observation, actors outside the companies were also consulted. This ensured insight into

the contextual issues relating to the WFD process from other sources as well, which helped broaden the researcher's understanding. Finally, to support the interpretations of the empirical material, other researchers working with the industry and the WFD were consulted as part of the final data collection component. By doing so, the validity of the findings in this study have been increased.

4 Case findings

This chapter presents the results of the case study involving Norwegian hydropower producers (HP producers) and the Water Framework Directive (WFD). The objective of this empirical part is to add evidence to the theoretical framework presented in Chapter 2.

To set the scene I first give an overall introduction to the case[6], which also provides an insight into the institutional context. Thereafter, I move on to the HP producers' responses to the WFD and their perceptions, and finally the interplay with the institutional context.

4.1 WFD and the Norwegian hydropower industry

The Water Framework Directive is a EU Directive for integrated river basin management. The WFD requires "good water status (GES)" for European waters by 2015, and Norway by 2021. This is to be achieved through a system of participatory river basin management planning and is supported by several assessments and extensive monitoring. The WFD as such is not a sectoral regulation; it takes the river basin as the unit. The directive requires measures to tackle water quality, quantity and management issues to be shared proportionately and equitably across all of who create and/or contribute to them. Thus, the WFD process deliberately brings together main actors and contributors, which constitutes an interesting perspective from an institutional point of view. The WFD has been called one of the most ambitious and encompassing pieces of environmental legislation within the EU at present (Liefferink et al. 2011) and it is expected to be a substantial driver for achieving sustainable management of water for years to come (Achleitner et al. 2005).

In Norway, the WFD was transposed into Norwegian law in 2007 as an environmental regulation ("Vannforskriften"). The first phase (2007-2009) was a "test period" where Norwegian authorities selected 29 pilot areas to participate in the "common European learning process" within the EU WFD implementation. The 29 pilot areas will follow the first planning cycle (environmental goals to be reached 2015), while the remaining follow the second planning cycle (2010-2015) where the environmental requirements needs to be met by 2021[7]. Hydropower is one of the activities that influence the ecology in watercourses. The WFD is therefore anticipated to have consequences for the hydropower production industry, yet exactly

[6] I do not try to give a comprehensive overview of a hydropower production and WFD in Norway as a whole, but rather present empirical findings relevant for the research questions in this thesis.
[7] www.vannportalen.no

which and how are still to be settled in Norway. At the same time there is currently a strong interest in developing more hydropower in Norway.

4.1.1 The Norwegian hydropower industry

In Norway almost 100 % of the electricity production comes from hydropower. In terms of the total energy mix hydropower constitutes about 60% and there is a national ambition to increase this even more.

A common Norwegian-Swedish market for electricity certificates was recently put in place to increase the renewable production; this was formally established in 1 January 2012. By 2020 Norway and Sweden are to produce 26,4 TWh new renewable energy, 13,2 TWh for each country[8]. Furthermore, the EU RES Directive was formally adopted during spring of 2009. This Directive puts in place binding targets to be reached for all Member States regarding the share of renewable energy in the total energy mix. The target for Norway was set in 2011 to be a 65,7 % renewable share of its energy mix by 2020. This is rather high when compared to other countries and it is due to Norway's already large renewable share (about 60%), since most of the el-production already is coming from hydropower. Both the certificate market with Sweden and the RES-target pulls in a direction of focus on increased renewable energy production, in which hydropower production is anticipated to be a significant contributor.

In terms of the hydropower industry a few key players dominate the Norwegian hydropower production (Appendix B). Statkraft is by far the biggest player in the Norwegian electricity market, holding 40 % of total production capacity. The second largest player E-CO Energi which owns about 8 % of the generating capacity through direct ownership and 11 % when adjusted for indirect ownership. Accordingly, how such dominating actors choose to address the WFD can be said to be of significance, both for the industry and the environment. In terms of the case companies Statkraft is state owned, the municipality of Oslo owns E-CO Hydropower, Agder Energy Production is owned by Statkraft (45.5%) and 31 municipalities in the Agder Region, BKK is owned by Statkraft (49.90%) and 17 municipalities in Hordaland County and Lyse Production is owned by 16 municipalities in Rogaland County.

On the industry level, Energy Norway is one of the actors representing the industry. Energy Norway is a member-based non-profit industry association representing about 270 companies involved in the production, distribution and trading of electricity in Norway, whereof about 70

[8] http://www.regjeringen.no/en/dep/oed/Subject/energy-in-norway.html?id=86981

are hydropower producers. Energy Norway has during the time of investigation (2011-2012) taken an increasingly active role in the WFD discussions with regards to hydropower production.

The principal institutional actor in the energy sector is the Ministry of Petroleum and Energy (MoPE). On the operational level, as a sub-ordinate agency, the Norwegian Water Resources and Energy Directorate (NVE) is responsible for handling the applications for hydropower licenses and the related assessments. On the national level a crucial inter-ministerial axis for hydropower goes between the MoPE and the Ministry of the Environment (MoE). MoE is particularly involved in all issues pertaining to nature and landscape protection, biodiversity, as well as land-use and spatial planning (Knutsen & Ruud 2011). MoE is the national institution with the overall responsibility of the WFD implementation in Norway.

Laws, regulations and licenses regulate the hydropower industry and the political and legal framework for hydropower is significantly rooted in historical processes, by legislative principles and practices characterized by various historic periods (Angell & Brekke 2011). A number of legal acts and regulations apply to different stages of initiating, planning, licensing and revision of hydropower projects (Knutsen & Ruud 2011). Hydropower concessions may be required to be revised every 30 years. Several such revisions of concessions are expected in the years to come, approximately 400 until 2022 (NVE). This involves re-licensing and also potential upgrading and extension of hydropower plants.

4.1.2 The WFD implementation in Norway

In Norway, on the overall national level, the authority responsible for the WFD implementation is the Ministry of Environment (MoE), with the Norwegian Directorate for Nature Management (DN) as the operational level. This was decided after a period of debate on whether it should be the MoE or the Ministry of Energy and Petroleum (MoEP) that should have the overall national responsibilities (this was learned through the interviews with industry experts).

In terms of regional implementation, Norway is divided into 11[9] main River Basin Districts and within each district there are a number of local river basin sub-districts. The environmental goals are to be reached through the development of River Basin Management Plans for these river basins. The districts are managed by River Basin Authorities appointed by the

[9] 16 if river basins draining to the sea or Sweden are included

Government. The River Basin Authority is today the County Council, who has the responsibility for follow-up at the regional level; that is, the planning processes of the River Basin Management Plans and the management of the regional committees and working groups (Knutsen & Ruud 2011). The responsibility was transferred to them from the County Governor in 2010. Sector authorities, counties and municipalities are responsible for assessing the necessary measures within their areas of responsibility. HP producers can formally take part in the development of the plans via so-called reference groups in each river basin.

An important part of the WFD implementation in Norway is the principle that concrete measures must be based on sectoral legislation (Knutsen & Ruud 2011). As a result of the approval of the first 29 River Basin Management Plans by the Government in June 2010, it was decided that for measures related to hydropower this should be settled through the existing system. Thus, in terms of hydropower, this means that the NVE continues to coordinate the license processes for hydropower as before, but now also being informed by the regional River Basin Management Plans. Any changes in the environmental measures for existing hydropower should be settled through the existing concession system and revision of terms (Knutsen & Ruud 2011). Very few revisions of terms have yet been conducted, so it is not known how this will be carried out in practical terms.

During the interviews with the HP producers in 2011, all the companies emphasized that Norway already has a substantial "apparatus" for dealing with HP licensing and environmental assessments, making a reference to the licensing processes and governing laws. Thus, the companies were supportive of the decision made in 2010 that the WFD should be handled within the existing sectorial mechanism and through the existing processes with the NVE.

However, not all actors agreed with the decision to implement the WFD in this manner. In early 2011 the National Association of Hydropower Municipalities (LVK) together with other NGOs representing environmental and recreational interests filed a complaint to the EFTA Surveillance Authority (ESA) about the Norwegian follow-up of the WFD. According to them, the Government's decision to set environmental standards for hydropower through the licensing process, rather than as environmental objectives within the River Basin Management Plans, is not inline with the demands of the Directive (Knutsen & Ruud 2011). After a period of time of review, ESA came back to Norway with some questions for clarification, which MoE answered 31 May 2012. In their reply MoE underline that Norway has sufficient legal instruments to ensure compliance with the WFD, supporting the established way of

implementation. The industry association Energy Norway shared on their website (12 June 2012) that they were happy with the replies of MoE to ESA. ESA is still to come back to Norway with final remarks on the issue.

4.1.3 Hydropower production and the WFD

The ecology of water courses, the concern of the WFD, is related to how hydropower production is operated. Potential consequence for the HP producers could therefore be increased costs of e.g. providing mitigation measures at the hydropower installations and issues regarding minimum flow. The WFD could imply a change and a potential loss in production, particularly related to regulations for environmental minimum flows. The average HP production in Norway during the last 10 years has been 123,8 TWh, according to data from NVE. The WFD could imply a potential reduction in production of 5–12 TWh each year, depending on seasonal variations (NVE). This is however an issue under debate and elaboration.

Effects on hydropower production relate in particular to what is termed Heavily Modified Water Bodies (HMWB) within the WFD. HMWB are bodies of water that because of physical alterations made by human activity are substantially changed in their character and therefore cannot meet the "good ecological status (GES)". Instead of GES the environmental objective for HMWB is "good ecological potential (GEP)". Under certain conditions the WFD permits the countries to identify HMWB and the assignment of less stringent objectives to water bodies[10]. Hydropower is one of the main reasons for water bodies to be classified as HMWB. For defining GEP, it is mandatory to apply a combined ecologic and socio-economic approach, which implies considering both the ecological aspects, but also that the financial resources are spent in a cost-effective way. Both scientifically and in practice, this has proven to be a challenging task (Bakken et al. 2012). Therefore the actual environmental goals of GEP for HMVBs in Norway have not been settled yet.

Studies do indicate that it could be possible to carefully develop hydropower, with sufficient mitigation measures in place (Thaulow et al. 2008), without conflicting with the objectives of the WFD. These studies are however not directly linked to the WFD. Furthermore, many of the suggestions would require an assessment of the river basin as a whole, inline with the WFD, which is not the case with the licensing system today as it is mainly based on a case-by-case assessment (Knutsen & Ruud 2011). Further, existing hydropower infrastructure could

[10] Article 4(3), 4(4) and 4(5) of the WFD

potentially be upgraded with more efficient turbines, and existing dams could be retrofitted with minimal environmental impact (Thaulow et al. 2007). Approaching the end of 2012 it was around these issues the debate was circulating, as it is through the revision of terms for concessions, informed by the WFD River Basin Management Plans, where the measures are to be taken into account. In terms of the case companies for this study, they did also talk about such measures during the interviews in 2011; they did however not relate it to, or necessarily think that the WFD was needed for this (see Section 4.2).

In Norway there has always been a very high recognition of the natural environment and the debate on hydropower vs. nature has been going through phases (Angell & Brekke 2011). Furthermore, the WFD has stimulated the debate on the future usage of water resources in Norway (Knutsen & Ruud 2011; Bakken et al. 2012). The current aspect of climate change has added an additional layer to the debate, since it has put the focus on hydropower as a renewable energy source; for example, Norway is seen as a potential green battery for Europe[11].

4.2 HP producers' early responses to the WFD

At the time of company interviews in spring 2011, most of the HP producers experienced the WFD implementation to not really have started yet, since the issues related to hydropower still had not been substantially addressed. This was demonstrated by expressions like "it has not really started", "it is still very early in the process", "we don't really know what this will mean yet".

In terms of *business responses* to the WFD, concerning to how they run their HP production, none of the companies had made any changes as a direct result of the WFD, nor did they anticipate (proactively) making any. Hence, the HP producers responded mainly with *business-as-usual*. All the companies stated that they would comply with any restrictions that may come, but that they hoped that these would be "appropriate" given the importance of hydropower production. In terms of changes in organizational and/or R&D activities, some of the companies reported on recent changes that they had made. These were *partly* related to the WFD, but the companies would not say that this was as a result of the WFD directly; they associated it more with an environmental focus in general. Accordingly, all the companies did seem coherent in their view that they did not anticipate making any changes in their core business activities as a result of the WFD.

[11] www.cedren.no

When it came to *political responses* to the WFD, the HP producers said that it consisted mainly of responding to hearings and taking part in the formal WFD process (for those of the HP producers where this had started). This can be exemplified by the following quote from one of the interviewees: "We have not been that active, but we are following. It is important to take part to ensure that things are done correct", or this quote from another company: "We have been active in the consultation process and had to work with that, but it's not a demanding job, just to make sure that something is not written that we can not vouch for."[12] Table 4 below summarizes the major overall responses of the HP producers in terms of types and mode.

Table 4 Overview of HP producers' responses related to the WFD (mainly based on companies 'self-reporting' during interviews in spring 2011).

Response type	**Response activity**	**Details**
Business	Changes in hydropower production routines	None of the companies report on changes in hydropower production routines as a direct result of the WFD. They did not foresee making such changes due to the WFD, unless demanded or "channeled" through the licensing authority (NVE).
	Organizational changes	No major organizational changes Statkraft reported on no changes ECO reported on recruitment of environmental coordinator *partly* related to WFD. It was verified that this person was hired in June 2011. Agder Energi reported on no particular changes, but said that this was being discussed in the management. Lyse reported that they also recently had hired and environmental engineer and partly related this to the WFD. This was not the main task of the person. BKK reported on a planned internal project on the WFD. It was later verified that such a project had been established, but a little less extensive than originally anticipated.
	R&D activities	R&D on related environmental activates takes place, but is *not driven* by the WFD according to the interviewees themselves. This was the case for all the companies.
Political	Political activities	All companies take part (in a various degree) in external activities e.g. hearing notes, industry network groups. They did report that they mainly respond to the hearing processes.
Political and/or business	Influence	The main reported influencing activities of the firms on a deliberate level (at least what was shared during the interviews) were in type od political activities. Furthermore, much of the political activity at this time seemed to be channeled through the industry association.
	Compliance	All the companies see themselves as a part of a highly regulated industry. There is a strong focus on compliance reported in the interviews. All companies reported that they would comply with (eventual) requirements that may come.

In terms of the overall *nature of the responses*, meaning if they were supportive of or opposing the WFD, I found that none of the companies were directly opposing the WFD. Most responses did however seem to have the nature of *defensive of the status quo*. Several of the interviewees questioned the need for the WFD. They also expressed uncertainties of what it would mean in

[12] Quotes are translated from Norwegian. Some of the original quotes can be found in Annex C

practical terms. All companies emphasized the relevance of hydropower as a climate-friendly renewable energy source and some mentioned the obligations of security of supply of energy. One company interviewee expressed it like this: "It is not us who make the decisions, but we can defend our role", demonstrating the overall desire to maintain the current role of hydropower.

Several of the interviewees explicitly said that the HP industry had so far taken a reactive approach as exemplified by the following quote: “When it comes to the industry, we have for many years been pretty laid back. We have not been a driving force in any way.” The main impression during 2011 was that the companies did take part in WFD processes as they came up and furthermore partly consolidated their views through the industry association and sharing of experiences.

The companies said that they relied on the industry association Energy Norway to represent the industry interests and make statements concerning the overall interest of the industry. One of the interviewees said: “It is Energy Norway that keeps track of the WFD, except where we sit in these reference groups.” One company did however mention that it is important to take part in hearings also for individual companies, as “it is not irrelevant as to how many makes a statement” in terms of getting points across.

In February 2011 the industry created an informal network of representatives from major regional power companies, coordinated by Energy Norway, to follow the work of the River Basin Management Plans in all the River Basin Districts. It said on the website of Energy Norway that the network is coordinated by the industry association “to ensure that the hydropower industry is always present and participate in processes at relevant arenas”[13]. Through an interview with a representative from the industry association just recently after the formation, I learned that one of the main reasons for establishing such a network was the fact that the industry had experienced, by several occasions that they were not invited to all relevant meetings etc.

The companies also said that they informally exchanged experiences with regards to the WFD, on how to best make sense of the WFD, what it means to them and how to deal with this. Possibly some firms were gaining more from this than others at the time of investigation since some companies had been part of the “test phase of the WFD”. Statkraft, the largest HP

[13] http://www.energinorge.no/energiproduksjon/bransjenettverk-for-oppfoelging-av-vannforskriften-article8485-238.html

producer, with production in several parts of Norway, had been one of the more active participants in the political space, partly together with Energy Norway. Some of the other informants did say that Statkraft was a bit ahead. One informant did however say: "also other HP producers are now getting 'up to speed on the issue'". Hence, there was some variance in how companies engaged in the political activities, or indications of such from the interviews, but also here the companies seemed rather coherent.

Furthermore, it should be mentioned that there, during 2011, was some anticipation of the WFD process becoming more concrete. It was mentioned that the industry wants to contribute to the discussions and solutions, yet within the interests of the industry, which is not so surprising. This quote by one of the interviewees exemplifies this: "what we are thinking is that we can contribute to find some good solutions, then the government will have to decide based on national interests".

So, what motivated these particular early response types, modes and natures in terms of the firms' perceptions and cognitive framing? How did the institutional context come into play? In the next sections I will address these aspects with reference to the theoretical framework outlined in chapter 2.

4.3 HP producers' early perceptions of the WFD

When it came to how the HP producers perceived the WFD at the time of the interviews, it was apparent that it was still new to most of them and as shown there were several issues that were unsettled as to how the WFD would play out in terms of hydropower in Norway. In this section I will first address the various perceptions related to the three regulatory dimensions of study, before moving on to institutional issues in the next section.

4.3.1 Perceptions of the WFD itself

In terms of the HP producers' perceptions of the WFD and the two considered frames of threat or opportunity, threat seemed to be the most relevant. Yet, with some nuances, most of the companies were just starting to address the WFD. For most of them the perceptions were related to that fact that the WFD was still something new.

Whether the WFD had actually made it to the "radar" of the HP producers was questioned, in early 2011, by one of the academic informants that had been working with the industry in early phases. The informant made the following reflection: " I wonder if they see it at all... It's MoPE and NVE that is leading this struggle and the power companies feel it is distant, but that's just

my feeling, I do not know. Now also some time has passed as well." During the company interviews in spring 2011 it became apparent that the HP producers were becoming more aware of the WFD, and it appeared to be an increasing level of engagement.

When it came to the two cognitive frames of threat and opportunity and the WFD, on the industry level it seemed that a threat frame was dominating. In the media there were several references to a threats in connection with industry level comments, exemplified with the following headline "Fear of loss of production" (TU 1 June 2011)[14]. However, during the company interviews, two of the interviewees from different companies actually pointed out that they found this "threat-focus" to be a bit too much, but that it was getting better now.

Still, at firm level, at the time of the interviews, there were several indications of a threat framing. It was mostly of a defensive nature connected to a potential loss of the status quo production. One company interviewee said it like this: "In the production industry there is probably a fear of what the implementation of the WFD could lead to. I assume particularly for older hydropower plants where there are no demands for minimum flows, it may lead to substantial production losses". Concerning the potential loss of water, another industry interviewee shared "...we will defend that we don't get loss of water…we will on solid terms demonstrate that this is unfortunate for the society, there are issues like security of power, the greater environment and also value creation." It was my impression that such (political) activity was considered more of an industry-level action more than a firm-level activity.

Furthermore, since it had been decided that the actual measures related to hydropower were to be determined through the process of revision of terms, the companies did seem to perceive the WFD as less substantial than the already governing laws and regulations. One interviewee expressed: "I can not see that the WFD triggers so many actions that we would not have been imposed anyway ... a revision will provide new stringent environmental regulations, it is not the WFD that triggers this". An interviewee from another HP producer said: "I don't think I've seen anything yet happening in light of the WFD, but there are some things happening which can be linked to the WFD."

The HP producers did not question the need to focus on environmental issues and how to better deal with this. All of the companies, to various degrees, did take part in research relevant for environmental consequences of hydropower and possibilities for dealing with this. They did however not relate this directly to the WFD itself.

[14] http://www.tu.no/energi/2011/06/01/frykter-tapt-produksjon

All the HP producers did expect the WFD to become important in the future, as one of the interviewees said: "As of today the WFD is not so important in terms of concessions or special laws. Yet, it is indicated that this may become important; therefore, we have chosen to be present on the field". Another interviewee asked: "Is it something new or is a new word for something of the same? We don't know this before it becomes more concrete. On an overall level it looks very new, but on the concrete level it looks pretty much like before...but so far I feel pretty unsure about it ". The same interviewee continued: "When I say that it is not important, I do not say that it is not important, but I say that it has not started working yet". One of the company interviewees with more experiences with the WFD expressed: "The WFD is pretty neutral, really. The reason why we are a bit calm regarding this is that we have been following it".

This empirical study did not find HP producers that strongly perceived the WFD to be an opportunity for them. However, several were optimistic about the future. This was mostly related to continuing business as usual, not about change. Hence, it did not appear that the WFD itself was viewed as something that was, or could become, an opportunity for competitive advantage at the firm level. As mentioned, the firms did cooperate on issues regarding the WFD. This may potentially have something to do with the ownership structures of the firms, which are state-owned and/or owned by municipalities and also companies having ownership in each other. However, this was not further investigated.

What all the HP producers mentioned as positive about the WFD was that it puts focus on a knowledge-based management of the river basins. The following quotes from different companies illustrates this: "It is positive that the WFD puts emphasis on that it should be knowledge-based", "the knowledge update that is happening is of great benefit to us" and "it is very good that every river basin now will be addressed and that a knowledge-based assessment will be made." All the companies were positive to that, according to the WFD, specific environmental measures should be knowledge-based. The HP producers expressed concerns about if this so far had been taken care of in an adequate manner. The River Basin Management Plans are expected to become more important for licensing and revision of old concessions, and also the companies anticipated this. Still they were unsure about how. One of the interviewees said: "We as a power industry and developers of hydropower projects are faced with many 'arbitrary arguments', and arguments are used that are not related to facts." The term "arbitrary arguments", or "sjablongmessige argumenter" in Norwegian, was used by three of the five companies, and several interviewees, in describing previous experiences. The

companies highlighted the need to further develop a knowledge-based management of the river basins. One company said it like this: “We want to contribute to a better ecology of the rivers, but we want it to be for the right reasons”.

All the HP company interviewees mentioned that different actors have framed the WFD differently, referring in particular to environmentalist, in terms how “important” the WFD is. Some said that somebody probably would be “disappointed” in terms of the actual impacts the WFD will have. The companies mentioned in particular that there have been several “misinterpretations”. In addition, two companies mentioned that it seemed like some had perceived the WFD as something that they could use to “strangle the hydropower industry”. Another interviewee described it as “the good dreams arena”, and a third interviewee from a different company said: “We don’t mind pitching in, but it should be for the right reasons. It cannot be so that the hydropower industry is expected to pay for all others.” A quote by another company went like this: “There have been misunderstandings and some actors try to pretend that the Directive demands something that it does not. But this has started to tone down a bit now”[15]. For the industry, especially through Energy Norway, it has been important to emphasize that the WFD is a framework for a process and does not provide other actors with the chance to demand the HP producers to implement certain measures. The following quote by an industry representative exemplifies: “There are few substantive claims here, it is mainly a process directive. The directive sets the frame and the processes to arrive at a proper and balanced water management”. So at the time of the interviews how other actors perceived or framed the WFD did seem to concern the HP producers just as much as the WFD itself.

4.3.2 Perceptions of the implementation process

How did the HP producers perceived the implementation process? Firstly, there were perceptions about the different levels of WFD implementation. Secondly, the most significant variances among the firms were related to the perceptions of the regional implementation of the WFD in the River Basin Districts.

Firstly, as mentioned in the introduction of this chapter the decision made in 2010 that any changes in hydropower related to the WFD should be done during the revision of terms did seem to be inline with the wishes of the HP producers. None of them framed this directly as an opportunity, but I interpreted it, as it was perceived as beneficial to the companies. One of the industry informants put it like this: “I think that the hydropower producers saw this as a

15 This was in spring 2011

victory". Several of the HP producers did underline that with the current system the only way that new environmental measures can be put into place is through revision of the current concession for hydropower. This also seemed to influence the companies to stick to business-a-usual, at the time of the interviews in 2011, as there was no 'rush' to do anything differently in response to the WFD.

When it came to other facets of the WFD implementation process, it was mainly the two companies that had been part of the "trial phase" and the industry association Energy Norway that had most opinions of the earlier phases. They did refer to the "struggle" between MoE and MoEP in terms of who should be handling the WFD. One of the industry interviewees expressed it this way: "The overall governmental administration has not pulled in the same direction. There has been a struggle for the right to handle this. It has been disturbing for all". A company interviewee expressed: "The implementation has so far been influenced by an overall conflict between the governmental bodies and who should be responsible." One company interviewee also said that the fact that the MoE got the overall responsibility, not the MoEP, most likely had led to the process to have a slower start, and saying that this has not been a disadvantage as such for the industry.

Some interviewees mentioned that the change from the County Governor to the County Council as the regional WFD authority had led to the feeling of the need to "start over" and "teaching again". They were referring to the exchange of information that goes between the companies and the authority regarding clarifications related to hydropower production etc.

On an overall level, all the HP producers expressed concerns about the possibilities of introducing more bureaucracy to hydropower processes with the WFD, without being sure about the benefits. Expressions like the following exemplifies this: "it could be 'too much process'" and "the process could get in the way". One of the interviewee said: "It probably creates greater awareness related to an holistic approach, yet more cooks are getting involved…" expressing some concerns relating to the implementation process. Another interviewee from a different company said that: "An arena is created and in one way this brings a bit more politics into it".

It did seem that it was particular regulatory uncertainty aspect related to the implementation process that was most apparent when it came to the threat framing. It was still uncertain how the planning process and the plans from the River Basin Districts would be used to inform the revision of terms. Furthermore, there were some differences in terms of how the HP producers

perceived the process in their River Basin District or regulatory uncertainties associated with this. In terms of the process, some highlighted the human aspect of an implementation process that does involve human interactions. Those who had had good experiences with regards to the River Basin Districts did seem more positive towards the regional processes. These findings can be seen in relation to other research on the follow-up of the WFD in Norway; Indseth et al. (2010) found that there were substantial variations between regions in terms of the actual organization concerning the follow-up of River Basin Management Plans. These aspects are addressed further in the next section.

4.3.3 Perceptions of regulatory uncertainty

As seem from the previous sections, the WFD implementation in Norway has so far been governed by a case of unsettled issues. From the viewpoint of the firms, unsettled issues represents regulatory uncertainty. How did the firms perceive this uncertainty?

One industry informant said explicitly that the WFD did represent an uncertainty for the hydropower industry and therefore had reached board level for some hydropower companies. In terms of perceptions of regulatory uncertainty framed as a threat this was observed to appear at different levels and related to different assets of regulatory uncertainty as outlined in Chapter 2 section 2.3.5.

When it came to unsettled issues related to the goals and the measures of the WFD this was viewed as an industry level concern (during interviews in spring 2011). One company stated it like this: “Firstly, the authorities must make a move, that they decide one way or another, and then we need to act accordingly.” Another company said: “We have been relaxed because we are so highly-regulated ...but maybe for NVE there has been more as a result of the WFD because they have pressure groups hanging over them.” A third company also referred to the authorities: “The Directive is something that the authorities need to deal with. We comply with what we are required to and initiate the measure that we need to”. This illustrates that the companies perceive themselves as a regulated industry, which also influenced what activities they would engage in. This is linked to the institutional context, which will be further addressed in the next section.

As mentioned, in terms of the very early phase of the WFD implementation interviewees from different firms used the word “power struggle” to describe how the process has proceeded at the national level, also showing how a cognitive frame had established itself across the firms. Yet noted as disturbing, I got the impression that this national level issues were perceived to be

more of an industry level or sectorial authority relevant issue than something for the firms to directly engage in.

Hence, the perceptions of regulatory uncertainty at the firm level seemed to be most apparent and influential related the WFD process in their River Basin Districts. This was related mainly to doubts about the qualifications of the local authorities or uncertainties if the local WFD process allowed for proper opportunity to participate. One company specifically pointed out that if there were now to be more local and regional decisions this could lead to unequal conditions. This company also seemed to have the least trust in the local WFD authority. Several of the interviewees from the different HP companies made the point that how you chose to deal with the WFD would probably depend on whom you met and how they operate. As mentioned in the previous section, the HP producers that have had good experiences seemed to have a more positive outlook on the process. Firms that on the other hand perceived, or had personally experienced, that the process was not handled adequately from the local WFD authorities side, showed a more proactive defensive posture, in terms of "protecting the level of control". The following quote illustrates: "I'm skeptical to that the decisions should now be taken at County level. Not to hide, we are skeptical of the County Council and their competencies and ability to look outside its own…well, they have been very narrow in their arguments."

The issue of a real opportunity to participate in the regional and local processes was also raised by at least one of the case companies and Energy Norway in a recent hearing round ending December 2012/January 2013[16] about "significant issues" ("vesentlige spørsmål") as part of the formal WFD process. Thus, illustrating that this is still an issue of concern for the HP companies and the industry.

An industry informant pointed out that the WFD is a challenging environmental regulation: "It's a framework. All who has needed to be operational with this have struggled." Furthermore, the informant said: "The guidelines for heavily modified water bodies for the WFD have not come yet. This makes the struggle to be carried out on the wrong arena[17]." A civil servant expressed, in autumn 2011, that "as long as a no political agreement on what the Directive should mean can be reached, it is not easy to set the demands further down in the sector." This is inline with the framework by Hoffmann et al. (2008) that holds that uncertainty

[16] http://www.energinorge.no/energiproduksjon/oensker-fagbasert-vannforvaltning-article9615-238.html
[17] Spring 2011

relegated to the implementation process occurs during the early stages of a new regulation if both authorities and affected companies still lack experience and legal certainty.

From the interviews and the contextual analysis it became clear that the regulatory uncertainty was influencing both how the HP producers, and also industry level actors and authorities, perceived and dealt with the WFD during the time of investigation. Even though the WFD implementation in Norway did appear to have had a tough start, both the firms and the industry association did acknowledged some movement in the process illustrated by statements like “the discussions are getting more fruitful” (during interviews 2011).

4.4 Interplay with the institutional context

During the interviews and contextual analysis it became apparent that there were several mechanisms working together to motivate and influence the observed mostly reactive response mode of the HP producers. As outlined in Chapter 2 the institutional context consists of regulatory, normative and cognitive institutions or forces. Furthermore, there are the overall dynamics of the actors that are operating in the relevant context or ‘field’ around the issue.

Starting with the *cognitive institution*, relating to ”how we do things”, all of the HP producers expressed that there already are good mechanisms in place in Norway for ensuring the environmental assessments related to hydropower. One of the HP producers expressed it like this: ”We are not amateurs on this issue even though a WFD comes along, we do have a long hydropower history of over 100 years”. All the companies also said that today nothing can be done without taking the environment into account. This was also mentioned by one of the academic informants: “I do think that the HP producers perceive themselves to consider the environment already”.

Furthermore, the HP producers perceive themselves to be part of a tightly regulated industry. All the companies pointed out that they are strictly regulated in terms of how they operate; implying that changes in the hydropower production could not be done “just as such”. Two companies specifically mentioned that they seldom introduce water releases voluntarily. One of these interviewees pointed out that there are safety and risk considerations associated with this. For example, sometimes the overall risks of releasing water may not be fully mapped out. Hence, this interviewee said that the company rather preferred to comply with (within) set license terms. Another interviewee from the same company said "…we provide data and information. We have done a few voluntary measures earlier, but we might have done them

anyway due to upcoming revision of terms, otherwise it is the licensing authority that governs our activities." When discussing what could be done, a third company said, that they could introduce self-imposed restrictions, but that they most likely would do that in relation to revision of terms. So, what this illustrates is some difference of opinions, yet on an overall level an industry that perceives it self to be tightly situated within the governing licensing routines and institutional set-up.

Moreover, all the companies made reference to how the hydropower production had evolved through the last 50-40 years: from a period where hydropower was used "to build the country" until today with much more comprehensive environmental considerations, and all said that that this was a healthy development. When talking about the environmental demands of the WFD, one interviewee said: "In our industry, this was certainly not absent from before. The industry has developed in that direction. It refers to a modern management, it's not that shocking new". Furthermore, the relevance of hydropower as a renewable energy source seemed to have established itself as a prevailing identity frame for the HP industry. This can be exemplified by the following quote from one of the company interviewees: "I find the overall picture has improved. The hydropower industry has received a lot for free through the threat of climate change, basically." This illustrates that when the context changes it may also lead to different perceptions about business activities, even though they are more or less the same. Furthermore, it is not just how the context objectively changes but also how this change is perceived or framed and how this matches with the activity; e.g. climate change *as a threat* (context) and hydropower as *an important renewable energy source* (identity frame). This again may influence to or justify certain responses to a new environmental regulation.

In addition to the WFD there were other *regulatory institutions* working in the institutional context influencing the hydropower production industry. As an example, there is a pressure to produce more renewable energy related to the EU RES Directive, which may additionally represent more of an apparent opportunity for the HP producers. This, on the other hand, is also a challenge for the sectoral authorities, like NVE, which the HP producers seem too lean into to when it comes to the overall national level clarifications. There were, and still are, potential conflicting goals that the sectoral authority needs to deal with. A civil servant stated during an interview autumn 2011 that "an assumed loss of 5–12 TWh fits badly with an renewable target of 13 TWh new production" to illustrate challenges beyond those only related to the WFD itself.

Furthermore, both social pressures and *normative institutions* were detected influencing the HP producers' perceptions and answers regarding what would be the appropriate responses to the WFD. One company interviewee explained: "I don't think the larger companies dare, or want to, do anything other than follow environmental demands" when talking about the visibility and reputations of the larger HP producers. An interviewee from another company said "it probably doesn't hurt that we have a critical light on us" when talking about the industry and environment in general. An academic informant said, "I think that the Norwegian power companies, at least Statkraft, are so used to a very alert opposition in Norway that they would not take on projects that they think are typically negative." Thus, these larger HP companies shape the environmental orientation not only by complying in the regulatory sense, but also by attaining to social pressures and norms. All of the case companies brought this issue up during the interviews. Two of the interviewees, from different companies, recognized that the WFD might work to keep "the industry on the right track", one of them asked, "what if had not been there?"

A special focus on knowledge was noted during the investigations; this may be related to the complexity of the issues that the WFD addresses and that the WFD is rooted in knowledge-based water management. The industry association and the HP companies emphasized strongly that WFD is not just about maximizing for the environment, but also about taking into account the socio-economic benefits of hydropower production. An industry interviewee said that "we will not get rid of the conflict of interest and we need a knowledge base that is good and gives decision support." It was interesting to note that the HP producers focus on knowledge did not relate only to the need for environmental knowledge *per se*, but just as much to how the current knowledge is used, or not used, and by whom today. This is inline with findings in a recent study by Egeland and Jacobsen (2012), related to hydropower in Norway , where they found that which knowledge is seen as legitimate and valid is not straight forward, but also depends on the various actors.

In an institutional context there are actors working. Particularly relevant to put forward for this study is the observed role of the industry association during the period of investigation (2011-2012). As it has been shown in the previous sections, the industry association served as a channel for information about the WFD development to the industry, in cooperation with several of the case companies. Furthermore, Energy Norway was representing the industries interest on the national level. Energy Norway emphasized the need to get the leaders in the HP companies involved and said, during an interview in spring 2011, that the leaders

understanding of the issue had increased. They noted that there were differences in levels of engagement and that it was mainly the few larger companies that were the most active at that time. In terms of getting the HP industry involved, Energy Norway has put an effort in trying to mobilize all HP producers to take an active part in the WFD process. During the time of investigation, Energy Norway's WFD related activities increased and seminars and courses have been held for the HP producers. From the second half of 2011 and through out 2012 Energy Norway and NVE, the sectoral authority, joined forces to hold WFD courses for the HP producers, and motivating by for example demonstrating that this is relevant for "you and your water". Based on impressions gained during the investigations, this seems to be of a mutual benefit and interest for these two actors. NVE is dependent on the HP producers to take part in the process because they hold valuable knowledge on which measures that would be most relevant and appropriate at certain places in the river basins. Energy Norway is working for its members to ensure the best conditions for the HP industry as a whole, and encourages HP producers to get informed and involved for better leverage.

Based on the company interviews with HP producers in 2011, I observed that the interviewees shared a common language and had many similar phrasings across the companies. Whether this was coincidental was not further investigated, yet through their interactions and via events like Energy Norway seminars and the informal established network, collectively held frames may have developed and/or been reinforced.

Towards the end of the investigations in 2012 it seemed like the WFD with regards to hydropower, had started to be dominantly framed as a knowledge-based trade-off process between environmental goals and energy demands (Bakken et al. 2012). Hence, a frame going beyond a "pure environmental protection directive". This could have relevance for future perceptions and responses of the HP producers and their interactions with other actors, since the HP producers interviewed had expressed concerns about how other actors had (mis)perceived the WFD.

Furthermore, drawing lines between processes that are not formally related but still intertwined; in May 2012 MoE and MoP initiated a project, that will be carried out between NVE and DN, to go through all the awaiting revisions of terms and make a prioritization of the revisions by May 2013. This prioritization will feed into the revision of terms licensing process together the River Basin Management Plans of the WFD. This illustrates that there are recent developments in the institutional context relating to collaborations between the energy and

water administrations, which potentially also could influence the HP producers' perceptions and responses in the future. During the interviews in spring 2011 the HP producers did express a positive attitude in contributing to establishing good solutions both for the environment and energy production.

On an overall level it is apparent that the institutional context has been influencing the HP producers perceptions and responses so far. What would be relevant to follow-up on is how the firm responses develop with the institutions and institutional context, since this it obviously a dynamic field where forces seem to go in several directions.

4.5 Linking the evidence and the theoretical propositions

Conducting the empirical case study I found that the overall theoretical framework and conceptual model established in Chapter 2 was useful and relevant in order to build knowledge on how firms respond to a new environmental regulation. For the case companies the responses to the WFD were dominantly reactive in mode, both in terms of business and political response. The nature of the responses was mainly neutral or defensive, meaning there was an interest to protect the industries current 'license to operate' and business as usual. This was, on an overall level, related to a threat framing of various strengths and also related to different regulatory aspects. Not all combinations of responses and framing were observed, yet the empirical material did provide some general trends. Table 5 gives a summary of whether the associated propositions were supported or not by the empirical material.

Proposition 1 about a threat frame of the environmental regulation being positively associated with a reactive business response and proactive political response of defensive nature is supported. Proposition 2 concerning an opportunity frame was indirectly supported: none of the companies did perceive the WFD as an direct opportunity combined with that none of the companies were responding with a proactive business responses nor proactively supporting the WFD politically. Moving on to the propositions about the implementation process, proposition 3 and proposition 4 were partly supported. There was not so much data yet, but it did seem to mobilize a proactive political response of a defensive nature if they perceived the implementation process as a threat, and, with less evidence, a supportive political response if they perceived is as an opportunity. In terms of the implementation process it was somewhat tricky to differentiate if it was perceptions of the implementation process *per se* or of

regulatory uncertainty associated with it that the firms were responding to. Most likely these two are also inter-related. Turning to proposition 5 and 6 on perceptions of regulatory uncertainties as a threat, this was particularly evident at a few firms. Firms that perceived that the implementation process was not handled correctly from the local WFD authorities side showed a more defensive reaction. Moreover, on the industry level part of the reason for establishing an informal WFD network coordinated by the industry association was to make sure that the industry was included at all relevant meetings, based on experiences of being left out.

Finally, the empirical evidence lends support for proposition 7 that the institutional context influences the overall dynamics of cognitive framing, perceptions and responses by firms. For example, there were multiple institutional pressures working, not only framing of the WFD was important but also how the companies view themselves and their role, and how they perceive other actors' framings of the WFD.

Table 5 Linking the empirical data and the propositions

Proposition	**Supported or not**	**Companies showing evidence**
P1: A new environmental regulation *framed as a threat* will positively influence proactive political response of a defensive nature and a reactive business response, depending on the degree of perceived treat. That is, with a high degree of perceived threat firms are more likely to: **a**) adopt proactive political responses of a defensive nature with resistance towards changing status quo **b)** respond reactively in terms of business response (wait-and see, comply)	**P1a**: *Supported* **P1b**: *Supported* Various degree of threat framing among the companies and at industry level (weak – medium) Political: evidence of protecting the status quo Business: business as usual (no change)	All
P2: A new environmental regulation *framed as an opportunity* will positively influence proactive business response behavior and a proactive political response of a supportive nature, depending on degree of perceived opportunity. That is, with a high degree of perceived opportunity firms are more likely to: **a**) respond proactively in terms of business response of a radical nature (or incremental nature), depending on current level of development **b)** adopt proactive political responses of supportive nature	**P2:** *Indirectly supported* *No direct data* None of the companies perceive the WFD as a significant opportunity Positive to certain elements of the WFD: knowledge-based Political: no direct proactive support Business: business as usual (no change)	All & through industry association
P3: An implementation process, *framed as a threat*, will influence a firm's proactive political response of a defensive nature positively and a firms reactive business response positively. That is, firms perceiving the implementation process as a threat, or with a high level of unsatisfactory to the firm, are more likely to: **a)** engage proactively in political responses of a defensive nature to "protect the level of control" **b**) apply reactive "wait-and see" business responses to reduce risk	**P3.a**: *supported* **P3.b:** *not supported* No changes in business, but did not seem like it was caused by risk perception of the implementation	2 directly & through industry association
P4: An implementation process, *framed as an opportunity*, will influence a firm's political response of a supportive nature positively and proactive business response positively, depending on the level of perceived opportunity. That is, firms perceiving the implementation process as an opportunity, or beneficial to the firm, are more likely to: **a)** engage proactively in political responses of a supportive nature to leverage business opportunities or "control the process" **b)** apply proactive business responses (with anticipated support of the implementation process)	**P4.a**: *partly supported* Supportive of WFD measures for HP to be handled as part of sectoral revision of terms for hydropower Mainly through hearing (reactive), but 1 company also observed to explicitly working for this independent and before hearing rounds **P4.b:** *not supported* The companies had no plans of making business changes	All & through industry association
P5: A high level of regulatory uncertainty, *framed as a threat,* will influence a firm's proactive political response of a defensive nature positively and a reactive business response positively. That is, firms perceiving a high level of regulatory uncertainty framed as a threat are expected to: **a)** engage proactively in political responses to reduce this uncertainty to alleviate anticipated	**P5.a:** *partly supported* Various degree of experienced threat In particular related to implementation and defining GEP, related to the measures and goals of the WFD for hydropower. The latter discussion particularly on	2 directly & all via established industry network

negative effect, "protecting the level of control" **b)** apply reactive "wait-and see" business responses to reduce risk	industry level **P5.b**: *indirectly supported* Companies had no plans making changes, but will adjust accordingly "when things are settled". Thus, uncertainty could be said to be positively related to reactive business reply	
P6: Firms perceiving only a low level of regulatory uncertainty are less likely to engage in activities to reduce it. That is, a perceived low level of regulatory uncertainty framed as a treat is expected to have a neutral (no) influence on firms' responses to a new environmental regulation.	**P6:** *supported indirectly* Some perceived lower level of regulatory uncertainty with regards to the implementation, these also showed less proactive political response at regional level	1–2 companies
P7: The institutional context in which the firms are embedded, including institutions and their effects, influences the overall dynamics of cognitive framing, perceptions and responses by firms to a new environmental regulation and the interplay between these variables.	**P7**: *supported* All the companies made reference to the context like other regulations (regulative pressures), the need for climate-friendly energy (legitimization), the history of hydropower and how it operates (cognitive institution) and also pressures for larger hydropower companies to consider the environment (normative institution)	All

5 Discussion

In this chapter I discuss the most important theoretical and managerial implications of this study. Limitations of the study are accounted for and suggestion for further research is given.

The main area of research to which this thesis has aimed at contributing is business and environmental regulation. This thesis adds weight to the recent research that holds that in order to understand the regulation- firm response relationship, we need to start with the firm side of the relationship (Parker & Lehamnn Nielsen 2011). In particular, the study offers insight into the moderating role of cognitive framing and institutional context on the new environmental regulation – firm response relationship.

5.1 Theoretical implications

This thesis contributes to the understanding of firms' responses to a new environmental regulation, by demonstrating the importance of addressing both perceptual and also contextual variables associated with a new environmental regulation, beyond just the environmental regulation *per se*. One important implication of this study is that the new environmental regulation–firm response relation should not be seen as a linear one-way relationship, but rather as a part of a multi-level process in which firms, cognitive frames and perceptions and linkages among actors interplay with the institutional context.

Even though not all the suggested propositions were supported by the empirical case, the case study demonstrated the relevance of the proposed conceptual model and overarching theoretical framework in understanding firms' responses to a new environmental regulation. Somewhat surprisingly, relatively little variation was found among the responses of the HP producers to the WFD. Most of them were reactive, both in terms of business and political activities. A potential explanation for this could be similar shared cognitive frame(s) among the firms and/or the conforming nature of the institutional context. However, the underlying assumption that cognitive framing and perception influences the response of the firm to the regulation was confirmed through the case study. The findings from the case study also confirmed that the institutional context is intricately woven into firms' responses, perceptions and framing.

5.1.1 Role of cognitive framing

In this thesis I explored the influence of cognitive framing on firms' responses through firms' frames and perceptions of (i) the new environmental regulation itself, (ii) the implementation

process and (iii) regulatory uncertainty. Results from the empirical study showed that it was not necessarily the WFD *per se* that engaged the companies most, which provided evidence for a conceptual model that also considers the moderating effects of perception of the implementation process and regulatory uncertainty.

The results from the case study showed that *perceptions of the implementation process* of the WFD influenced firms' responses. The WFD is a process-oriented directive, so this might have been expected. Yet, this is inline with findings by Gerard and Lave (2007) on a study of technology-forcing policies (reviewed in Chapter 2); they found that the implementation process and its associated political dimension were the most important for the development of new technologies with the firms. The empirical study also illustrated that the implementation process is *relational*, meaning that the firms were not just interested and concerned about *what* but also *who*. The case firms showed a great interest in *other actors' frames* of the new environmental regulation under implementation. How firms perceived the other actors and also their frames contributed to influencing their responses to the regulation. This is inline with other recent research on environmental regulations; Russell et al. (2008) found that the tourist operators working in natural sensitive areas and their perception of the regulatory agency, not just the regulation per se, influenced how they responded to the regulation. As a result, how firms respond to a new environmental regulation needs to be looked at in the context on how it is both framed and used by the various actors, and how the process of practical implementation is taking place.

In the empirical study *regulatory uncertainty* was influencing both how the HP producers and also industry level actors and authorities perceived and dealt with the WFD during the time of investigation. Until now, studies of such regulatory uncertainty have mainly been focused on the different regulations surrounding a firm (Miller 1993), and less on different aspects of regulatory uncertainty associated with one specific regulation (Hoffmann et al. 2008). This study adds weight to the relevance of considering regulatory uncertainty and perceptions of such associated with one particular environmental regulation in order to understand firms' responses.

Hence, the empirical study confirmed the relevance of considering perceptions of multiple regulatory dimensions in order to understand firms' responses to the new environmental regulation. A theoretical implication is that these variables should be included in further studies of the impacts of new environmental regulations.

Cognitive framing issue is of particular interest since it is anticipated to have an influence on which opportunities are detected, or not, when firms engage with and respond to a new environmental regulation. From the empirical case it also became apparent that cognitive frames are more than just "neutral" devices to make sense of an issue or the context. The case firms were in many ways responding to others frames of the environmental regulation as the environmental regulation itself. The frames of firms, other actors and the regulatory authorities do also seem to be intertwined. Hence, frames contribute to the dynamics of the context and are therefore also the subject to conflicting interests (Beckert 2010). Competing interests and competing frames related to the environmental regulation are taking place through interactions among the actors in the institutional context. Therefore there is a need to also consider cognitive framing as a process among people (Hutchins 1995). This demonstrates the embeddedness of the cognitive framing in the conceptual model in Chapter 2. Furthermore, it implies that cognitive framing and institutional context should be considered in an integrated combined approach.

5.1.2 Role of institutional context

Firms do not operate in isolation from the context in which they are embedded in, and they can help shape the rules governing their conduct (Bagley 2010). The empirical case confirmed that *both the cognitive frames and responses* were shaped by and interplayed with the institutional context. Certain actions can become moderated because of the institutionalized practices. In these ways, the institutional context is an amplifier or reducer of the responses. In the empirical case there was elements of path dependency in the institutional set-up that seemed to influence how several issues related to hydropower production, both were perceived and conducted by HP producers and institutional actors, which again influenced the HP producers responses to the WFD.

Furthermore, within the empirical study the HP producers engaged in influencing the environmental regulation *indirectly*, deliberately or not, by emphasizing and legitimizing current practices and the importance of hydropower production as a renewable energy source. The firms also came together and responded to the environmental regulation through intermediaries in the institutional context, like the industry association. This also highlights the embeddedness of the environmental regulation–firm response relationship in an institutional context as demonstrated in the conceptual model in Chapter 2. An implication is that also both *indirect responses* and/or *collective responses* should be further considered within possible responses of firms. The empirical case study confirmed the relevance of the institutional

context, including institutions and their effects, which requires an explicit incorporation into the understanding of firms' responses to a new environmental regulation (Lounsbury & Hirsch 2010).

To sum up: The consideration of several regulatory dimensions related to an environmental regulation and the contributions of two main theoretical disciplines, cognitive framing and institutional theory, has allowed for a broader understanding of the new environmental–firm response relationship. I recommend that all the suggested variables in this thesis should be included in further studies of the (new) environmental regulation–firm response relationship.

5.2 Managerial implications

From a practical point of view, this research provides a framework that both scholars and managers can use to reflect on how to approach new environmental regulations. Firms, and also regulatory authorities, should be aware of both the challenges and opportunities that lie in this domain. This study has illustrated that there are multi-leveled contextual processes related to a new environmental regulation that firms can be influenced by, directly or indirectly, and also can influence, directly or indirectly.

Firms can benefit from understanding the way in which their managers, and those of other actors, perceive their influence over the regulatory process. Successfully navigating the regulatory process can allow firms not only to manage regulatory uncertainty, but also to shape their industries and to create potential opportunities for themselves.

It is important to be aware of both personal and other perceptions and frames, as they tend to have a governing influence on ways of action. It may be that there are no clear or major business opportunities related to a new environmental regulation from a firm's point of view. Yet, it is also important to be aware that managerial attention and the framing of issues affect firms' abilities to identify the possibilities. Literature shows that an opportunity framing tends to generate different activities than a threat framing (Dutton & Jackson 1987). Basically, "managers do not find profitable opportunities, where they do not look for them, and thus the ability to profit from pollution prevention depends critically on managers' expectations that such opportunities exists" (King & Lenox 2002). Hence, the managers should pay attention to which frames become dominant within their own company, or in the context in which the firm operates, as it may have impacts on firms' activities and results.

Since the cognitive framing is interplaying with the institutional context, it is particularly important to be aware that the frames also often are 'products' of old experiences and history. Adopting a dominant institutionalized frame could potentially narrow the scope and perceived possibilities associated with a new environmental regulation. In some cases, one may not only consider whether a new environmental regulation requires new capabilities by the actors involved, but whether it also requires new frames (Kaplan & Tripsas 2003).

Lastly, this study indicates that policymakers and regulatory authorities should pay attention to the human side of environmental regulations, in combination with environmental standards and technology choices; be aware that it is usually about more than just the regulation itself. Accordingly, the focus should be put on ensuring transparent processes just as much as designing the ultimate regulatory instrument.

5.3 Limitations of the study

The exploratory nature of this research means that the findings are tentative and need to be confirmed in other settings by other researchers. The empirical data has enabled a tentative testing of the proposed theoretical framework. What I have been able to show is how a combination of cognitive and institutional variables has relevance in explaining how firms respond to a new environmental regulation. However, the data collected is uneven in terms of the depth and more work needs to be done in this area.

In this thesis I confined the focus to large natural resources based incumbents. For the case study I focused on the largest producers from a well-established industry, namely the hydropower producers in Norway. Thus, the results can only be directly extended to large firms from industries with similar characteristics. Future research could investigate the relevance of the theoretical framework in different industry contexts and also with different types and sizes of firms. Furthermore, in the empirical part, I considered one specific environmental regulation: the WFD. Further studies could expand this analysis with parallel investigations of two different regulations within the same industry to see how the results would vary.

Several factors, not solely the cognitive framing and the institutional context, influence firms' responses to a new environmental regulation. To declare otherwise would be an inappropriate theoretical conclusion. Research could be further extended by also adding other theoretical approaches, including the resource-based view of the firm, in order to be able to account for

organizational and internal processes within the firms that may influence and/or explain firm responses. In addition, this could yield interesting research to investigate further how this interacts with the cognitive and institutional dimensions.

This study has taken an broad approach, thus resulting in a less degree of detail on each element in the proposed conceptual model. A limitation of this study is that it has not dealt with the relative strength and significance of the proposed influencing elements. Further studies could investigate the relative strength and importance of the influences by empirically demonstrating which pressures exert more relative influence under which conditions, and which pressures results in a stronger responsiveness of the firms. Such a study could also be extended with a quantitative survey. However this should be carefully drafted, as this is a complex issue with many inter-linkages as demonstrated in this study. The dynamics of the institutional context could have been refined even more, to gain an even better understanding on how this works together with the framing. In particular including also interactions with other actors in a more explicit way than what was done in this thesis.

Authors like Rugman and Verbeke (2000) and Hoffmann et al. (2008) argue that impacts of environmental regulations will most likely change with time. Furthermore, in order to understand the role that cognition plays in the ultimate outcomes, there is a need to go beyond snapshot maps (Oliver & Johnston 2000). The dynamic element of time was acknowledged by assuming that the influencing variables may change with time. Yet how these variables may change with time was not addressed within the scope and timeframe of the current thesis. A longitudinal study investigating how frames are formed and how they evolve over time and how this influences firms' responses to an environmental regulation under implementation could provide interesting insights.

5.4 Further research

In addition to the issues mentioned in the previous section this study has generated several avenues for further research.

Additional research could investigate further the embeddedness of sensemaking and framing in space and time related to an environmental regulation under implementation. As suggested in the theoretical framework in Chapter 2, there are relations between the micro-level cognition and how individuals or groups frame an issue and how this interplays with the more institutionalized cultural-cognitive institution (Kaplan & Tripsas 2003; Scott 2001). This

became apparent through the case study in the way that the HP producers rationalized their own views through making references to both the history of hydropower and also the general institutional set-up. Weber and Glynn (2006) concluded that people make sense *with* institutions, not in spite of them. Further research could investigate in more detail *how* this takes place in the context of firms' responses to a new environmental regulation.

Environmental issues and regulations are complex and may require new knowledge. An interesting avenue for research that emerged from the case study was the focus on knowledge and 'competencies trust' related to the implementation of a new environmental regulation. The case study showed that different actors might have different opinions on what knowledge related to environmental measures is relevant. An important future research topic is therefore the role of knowledge and competencies in the environmental regulatory processes; what kind of knowledge and competencies foster cooperation and what creates conflicts, and how does this intertwine with firms frames and response behavior?

With reference to natural resources based incumbents and environmental regulations it could lend interesting results in carry out analysis within one or several particular geographical natural region(s) and introducing also the facility-level. The physical conditions of the ecosystem may put constraints on what is actually possible in terms of business operations. Research also suggests that the geographical proximity influences ecological sense making (Whiteman & Cooper 2000; Whiteman & Cooper 2011). Hence, understanding the interactions of framing and decision-making at the centralized (firm level) vs. the decentralized (facility level) could add an interesting dimension for further research. According to Hart (1995) external legitimacy and reputation may influence the competitive advantage related to the natural resources, and be dependent on more cooperative action and transparency than the competition. With reference to the empirical case, an in-depth analysis on the implementation of the WFD within geographical regions (river basin) investigating the HP industry, firm and facility-level perspective in interaction with the other stakeholders could add a deeper understanding of the dynamics of environmental regulations, cognitive framing and institutional *and* ecosystem embeddedness.

6 Conclusions

In the scholarly literature, there is an expressed need to better understand the impacts of environmental regulations, both for business and the environment. To contribute to this understanding this thesis addressed the following main research question: *how do firms respond to a new environmental regulation relevant for their core business?* In contrast to prior research, which has been much focused on firm and industry antecedents of responses, I investigated the role of cognitive framing and institutional context. Accordingly, two supplementary research questions were explored: *how does cognitive framing influence the firms' responses to the new environmental regulation? How does the institutional context in which the firms are embedded interplay with the dynamics of firms' perceptions and responses to a new environmental regulation*?

To answer the research questions I developed a theoretical framework and a conceptual model as presented in the theory chapter. The framework was derived from a literature review on business and regulations, and by combining cognitive framing and "strategic issue" literature with institutional theory. Several theoretical and empirical studies were used as analytical building blocks to make the overarching theoretical framework and the conceptual model with its variables.

The focus of this study was on the "firm's side" of the new environmental regulation-firm response relationship. In terms of firms, I confined this study to natural resources based large incumbents, since they constitute an important part of the environment-business ecosystem. An overview of possible firm responses was presented and propositions were put forward as to show how cognitive framing, through the firms' perceptions, influences (amplifies or reduces) certain responses. Furthermore, the role of the institutional context was addressed.

The theoretical framework stipulates that a firm's response to a new environmental could be studied along the following three dimensions: *type* (business, political), *mode* (proactive, reactive) and *nature* (supportive, defensive, neutral) of the response. Furthermore, the "mix" of these dimensions is influenced by 1) firms' *frames* or perceptions and 2) the institutional context. The role of cognitive framing was explored through the following multiple dimensions: firms' (i) perception of the environmental regulation, (ii) perception of the implementation process, and (iii) perception of regulatory uncertainty. Derived from literature, the common frames of *threat* or *opportunity* were used for these variables. According to the institutional theory, the context in which the firm is embedded, influences both perceptions and

behavior of the firm (Hoffman & Ocasio 2001). Thus this process was also analyzed in terms of interactions with the institutional context.

The theoretical framework was further explored and tested through a case study of Norwegian hydropower producers and the Water Framework Directive (WFD) under early implementation in Norway. Empirical evidence was not found for all proposed propositions, however on an overall level the conceptual model and theoretical framework was found useful. The HP producers' responses were influenced not only by the perceptions of the regulation *per se*, but also by the implementation process and regulatory uncertainty. On an overall level, the process of cognitive framing was apparent and it should be explored further. The empirical case confirmed that *both the cognitive frames and responses* were shaped by and interplayed with the institutional context. Hence, I recommend that all the suggested variables in this thesis should be included in further studies of the (new) environmental regulation-firm response relationship.

This thesis has offered a theoretical framework and conceptual model that can be further developed in order for both scholars and managers to gain increased understanding of firms' responses to (new) environmental regulations and the motivation of these responses.

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Appendix A: Interview guide

INTERVIEW GUIDE – Hydropower companies
The interview was conducted in a flexible way, however below are outlines of questions that were addressed to the companies. For other stakeholders and the industry association the guide was adjusted. The interviews were carried out in Norwegian. *[The text given in brackets indicates study topical relevance, not explicitly mentioned to the interviewees]*

1. **Introduction**
   Short about my project and purpose of study. Confidentiality issues.

2. **About you**
   Could you shortly tell about:
   - Your education, position within the company, responsibilities and daily tasks
   - Your experience, responsibilities and tasks related to WFD/Vannforskriften
   - (WFD – Water Framework Directive)

[Perceptions. Opportunities and Challenges]

3. **The Hydropower industry and regulations in Norway (short)**
   a. How would you say the degree of (industry) regulation for your industry is compared to other industries?
   b. In general, for your company how important would you say environmental regulations are for the way you carry out production activities?
   c. In your impression, do all hydropower producers approach regulation issues in a similar manner or does it vary among companies?
   d. In level of importance, how would you compare **WFD** to other regulatory issues that that the industry needs to relate to? Why?
   e. In your opinion, how different is the **WFD** compared to other environmental regulations the hydropower industry is experiencing or has experienced before? Explain.
   f. What would you say are the main (expected) effects of the **WFD** for the hydropower industry in Norway? Opportunities and challenges/threats?

[Response - (external internal)]

4. **Implementation of the WFD in Norway**
   a. What is your opinion about the implementation process so far?
   b. What is your opinion about on the work of the responsible authorities/government so far?
   c. What is your opinion of on the level of involvement from the various actors?
   d. Does your company participate in official and unofficial working groups/network groups related to the WFD? Elaborate
   e. What have, in your opinion, been the biggest achievements and obstacles, you are aware of your standing, at this stage in the WFD implementation?

f. Does the WFD and the way it's implemented, in your opinion, promote or inhibit increased environmental proactiveness and innovation? Why? (What would be optimal?)

5. **Your Company**
    a. How would you consider the awareness of the WFD in your Company?
    b. When did your Company start working with WFD-related issues?
    c. How do you work with the WFD issues? (Differently than with other issues?)
    d. Who are the people, in terms of roles and activities, in your company working with the WFD?
    e. Have you, as a result of the WFD, made any changes:
        i. in your company
        ii. hydropower operations (technical or process)? (examples)
        iii. do you foresee changes?
    f. Does your company participate in research projects related to the WFD? Elaborate

[Contextual issues]

6. **Characteristics of the hydropower industry in Norway and the environment**
    a. In your opinion, how is the level of competitiveness in the industry (vs other industries)?
    b. In your opinion, to what degree hydropower production is environmentally - friendly? Motivation for answer
    c. In your opinion, is the political sphere and the media providing the public with a correct view of the hydropower production?

Anything else that you would like to add that you think is important for this study?

Appendix B: Case details

List of interviews

Date	Company	Role	Type	Category	Main use
6th April 2011, Oslo	Energi Norge	Advisor	Face-to-face, interview	Industry	Industry response context
8th April 2011, Oslo	E-CO Vannkraft	Management	Face-to-face, interview	Industry	Firm response Perceptions
13th April 2011, Oslo	Statkraft	Management	Face-to-face, interview	Industry	Firm response Perceptions
19th April 2011, Oslo	Statkraft	Environmental	Face-to-face, interview	Industry	Firm response Perceptions
26th April 2011, Oslo	Statkraft	Environmental	Phone, interview	Industry	Firm response Perceptions
27th April 2011, Kristiansand	Agder Energi	Management	Face-to-face, interview	Industry	Firm response Perceptions
27th April 2011 , Kristiansand	Agder Energi	Environmental	Face-to-face, interview	Industry	Firm response Perceptions
28th April 2011, Stavanger	Lyse Produsjon	Management	Face-to-face, interview	Industry	Firm response Perceptions
28th April 2011, Stavanger	Lyse Produsjon	Environmental	Face-to-face, interview	Industry	Firm response Perceptions
6th May 2011, Bergen	BKK	Environmental	Face-to-face, interview	Industry	Firm response Perceptions
6th May 2011, Bergen	BKK	Environmental	Face-to-face, interview	Industry	Firm response Perceptions
6th May 2011, Bergen	BKK	Management	Phone, interview	Industry	Firm response Perceptions
6th September 2011, Oslo	NVE	Advisor	Face-to-face, interview	Public servant	Industry response Context
28 September 2011, Oslo	Energi Norge	Advisor	Face-to-face, interview	Industry	Industry response Context
3 November 2011, Oslo	DN	Advisor	Phone, conversation	Public servant	WFD, Context, Industry response
8 November 2011, Oslo	NIBR	Researcher	Face-to-face, conversation	Research/ Academia	Context
10th November 2011, Oslo	CICERO	Researcher Scientists	Phone, conversation	Research/ Academia	Industry response, Context
30 th November 2011, Oslo	NVE	Advisor	Face-to-face, interview	Public servant	Industry response, Context
Several occasions	SINTEF Energi	Researcher Scientists	Face-to-face, conversation	Research/ Academia	WFD Industry response, Context
Several occasions	NIVA	Researcher Scientists	Face-to-face, conversation	Research /Academia	WFD Industry response, Context

List of main seminars and conferences attended

Date	Company	Use
16-17th March 2011	Nasjonal vannmiljøkonferanse 2011 (day 2) http://www.vannportalen.no/aktkal.aspx?m=42790&amid=3439408	WFD Context Industry
14th February 2012	Vannkraft i endring – utfordringer for vassdragenes sikkerhet og miljø? http://www.vannportalen.no/aktkal.aspx?m=42790&amid=3565805	Context Industry
27-28th March 2012	Nasjonal vannmiljøkonferanse 2012 http://www.vannportalen.no/aktkal.aspx?m=42790&amid=3542489	WFD Context Industry
April 2012	Two-day Water Flow Target workshop Workshop arranged by Sintef Energi with National researchers and managers and international experts Bakken et al (2012)	WFD and hydropower
5-6th June 2012	A Research Topic Seminar: The effects of environmental policy measures - potentials and challenges – UiO MILEN Research School	Business and regulation related to renewable energy in Norway

List of hydropower companies in Norway

List of energy companies with hydropower generation. Sorted based on hydropower. Data obtained from NVE by e-mail.

	A	B	C
4	Eierselskap	Sum av Eier MW	Sum av Eier GWh
5	STATKRAFT ENERGI AS	11 896	47 209
6	E-CO ENERGI	3 384	11 943
7	Norsk Hydro	1 848	8 638
8	AGDER ENERGI PRODUKSJON AS	1 876	7 880
9	BKK PRODUKSJON AS	1 390	6 077
10	LYSE PRODUKSJON AS	1 188	4 887
11	NTE ENERGI AS	697	3 075
12	ELKEM ENERGI AS	604	2 844
13	HAFSLUND PRODUKSJON AS	475	2 597
14	EB KRAFTPRODUKSJON AS	440	2 173
15	AKERSHUS KRAFT AS	397	2 034
16	EIDSIVA VANNKRAFT AS	430	1 923
17	ØSTFOLD ENERGI AS	427	1 842
18	SKS PRODUKSJON AS	383	1 729
19	TRØNDERENERGI KRAFT AS	264	1 204
20	SKL PRODUKSJON AS	392	1 265
21	TAFJORD KRAFTPRODUKSJON AS	313	1 165
22	TROMS KRAFT PRODUKSJON AS	243	1 123
23	HELGELANDSKRAFT AS	228	972
24	SFE PRODUKSJON AS	195	905
25	NORDKRAFT PRODUKSJON AS	181	722
26	BORREGAARD INDUSTRIES LIMITED, NORGE	101	545
27	TUSSA ENERGI AS	123	541
28	ARENDALS FOSSEKOMPANI ASA	73	485
29	TRØNDERENERGI AS	112	480
30	PASVIK KRAFT AS	77	444

Appendix C: Quotes

Since the quotes are translated to English in the text, some original example quotes in Norwegian are given here for reference. At the bottom are also a few expressions that seemed to have institutionalized itself within the industry group, as it was repeatedly mentioned by several of the interviewees from different firms.

Translation of original quotes from Norwegian to English
Not all quotes are included, and not all quotes here are included in the thesis's chapters itself.
WFD= WFD or the environmental regulation in general or the content part of it. IMP= WFD implementation process. Context= Context

Theme	Translated Quote	Original Quote	Category
Context	"We believe that we are strictly regulated, then there is also probably different views on how strict this is"	"Vi mener at vi er gjennomregulert, så er det sikker ulike syn på hvor strengt dette er"	HP producer
Reactive Defensive Political Activity	"It is not us who make the decisions, but we can defend our role"	"Det er ikke vi som bestemmer, men vi kan forsvare vår rolle"	HP producer
WFD	'For us this has not had much to say"	"For oss har det ikke betydd så mye"	HP producer
Reactive Political response Neutral/protective	"We have been active in the consultation process and had to work with that, but it's not a demanding job, just to make sure that something is not written that we can not vouch for"	"Vi har vært aktive i høringsprosessene og måtte jobbe med det, men det er ikke noen krevende jobb, bare passe på at det ikke skrives noe vi ikke kan stå inne for"	HP producer
WFD, IMP	"It probably creates greater awareness related to an holistic approach, yet more cooks are getting involved …"	"Skaper nok større bevissthet rundt dette med helhetstenkning, samtidig så blander det inn flere kokker…"	HP producer
WFD/ Political MP	"an arena is created and in one way brings a bit more politics into it"	" Man får en arena og det blir på en måte litt mer politikk i det"	HP producer
WFD Reactive response Compliant	"When it comes to the industry, we have for many years been pretty-laid back. We have not been a driving force in any way "	"Når det kommer til bransjen, så har vi jo i mange år vært ganske tilbakelent. Vi har ikke vært noen pådriver på noen måte"	HP producer
Context Reactive Firm response	"We have been relaxed because we are so highly-regulated ... but maybe for NVE there has been more as a result of the WFD because they have pressure groups hanging over them"	"Vi har vært avslappet fordi vi er så gjennomregulert… men kanskje for NVE har det vært mer som følge av vanndirektivet fordi de har pressgrupper hengende på seg"	HP producer
Reactive Response	"Firstly, the authorities must make a move, that they decide one way or another and then we need to act accordingly "	For det først må myndighetene gjøre et grep, at de bestemmer seg for et eller annet ..og da må vi innrette oss"	HP producer
Industry context	"Our primary task after all, is to produce electricity, that is why we get a license"	"Primæroppgaven vår er jo tross alt å produsere strøm, det er jo derfor vi får konsesjon"	HP producer
WFD Firm Perception	"WFD is pretty neutral, really. The reason why we are a bit calm regarding this is that we have been following this"	"Vanndirektivet er ganske nøytralt egentlig. Grunnen til at vi er litt rolige på dette er at vi har fulgt med på dette"	HP producer
WFD, IMP	"As of today WFD is not so important in terms of concessions or special laws.	"Per idag er ikke vanndirektivet så viktig i forhold til konsesjoner eller	HP producer

Political	Yet, it is indicated that this may become important; therefore, we have chosen to be present on the field".	særlover, samtidig er det gitt signaler om at dette kan komme til å bli viktig derfor har vi valgt å være på banen"	
WFD, IMP	"I perceive it [WFD] to be very different. Because there is much uncertainty attached to it and that what is linked to measures of implementation is related to the corresponding sectorial legislation. The implementation is supposed to happen through other policy"	"Jeg oppfatter den [Vanndirektivet] som veldig annerledes. Fordi det er mye usikkerhet knyttet til den, og at det som er knyttet til tiltak på gjennomføring er knyttet til oppfølging av særlovene..gjennomføringen skal jo skje gjennom annen forvaltning"	HP producer
WFD WFD WFD IMP Industry context	"It may have been more static in the past. As there was not given the minimum on water flow, so the guidelines were subsequently clearer. But it is perhaps not only due to WFD, but also the Water Act, which came around 2000"	"Det har kanskje vært mer statisk i fortiden. Da ble det ikke gitt minstevannføring, så rammene var klarer. Men det er kanskje ikke bare WFD, men også vannressursloven som kom rundt 2000"	HP producer
IMP	"The implementation has so far been influenced by an overall conflict between the governmental agencies and about who should be responsible"	"Implementeringen så langt har vært preget av en overordnet strid mellom forvaltningen og om hvem som skulle være ansvarlig"	HP producer
IMP	"I think it has been quite complex and is also not clear what should be our role"	"Jeg synes det har vært ganske uoversiktlig og også uklart hva som skal være vår rolle"	HP producer
Frames/ Perceptions IMP context	"We spent a lot of time to clarify the expectations the different actors had"	"Vi brukte mye tid på å avklare hvilke forventninger de forskjellige hadde"	HP producer
WFD Perception	"We indeed see that this could be an important directive for us."	Vi opplever vel at dette kan bli et viktig direktiv for oss."	HP producer
IMP Context (Frames/) Firm behavior	"I think we works differently with this, and I think it depends a lot on which counterparty you meet and how they work"	"Jeg tror man jobber forskjellige med dette, og jeg tror det avhenger mye av hvilken motpart man møter og hvordan de jobber"	HP producer
WFD IMP	"The exchange of information has had the greatest benefit / utility value"	"Informasjonsutvekslingen har hatt størst nytteverdi"	HP producer
IMP (Context)	"We use a lot of time on teaching others"	"Vi bruker veldig mye tid på å lære opp andre"	HP producer
(WFD) IMP	"The knowledge update that is happening is of great benefit to us"	"Kunnskapsoppdateringen som skjer har stor nytte for oss"	HP producer
WFD IMP	"There's a lot that is still very unclear. Who takes the responsibility? Who follows up?"	"Det er jo mye som fremdeles er veldig uklart. Hvem tar tak? Hvem følger opp?"	HP producer
Industry context Frames	"I find the overall picture has improved. The hydropower industry has received a lot for free through the threat of climate change, basically"	"Jeg synes bildet har bedret seg. Vannkraftbransjen har fått veldig mye gratis gjennom klimatrusselen rett og slett"	HP producer
Reactive Anticipating	"What we are thinking is that we can contribute to find some good solutions, then the government will have decide based on national interests"	"Det vi tenker her er at vi kan bidra til å finne noen gode løsninger, så får myndighetene bestemme ut i fra nasjonale hensyn".	HP producer
WFD	"It is positive that the WFD puts emphasis on that it should be knowledge-based"	"Det er positivt at vanndirektivet legger vekt på at det skal være kunnskapsbasert"	HP producer
HP production Industry	"I think the industry is concerned that you take some here and some there and	"Jeg tror bransjen er opptatt av at man spiser litt her og spiser litt der og	HP producer

context	in the end you have a problem"	til slutt har man et problem"	
WFD	"I think it will become important. What can be both an advantage and a disadvantage is that it now will be more locally governed. It will to a large degree be politically run on a local level, which may lead to a situation that in one water region there is one philosophy and in another one another"	"Jeg tro jo det kommer til å bli viktigt. Det som kan være en fordel eller ulempe at det nå blir mer lokalt forankret. Det blir i jo i stor grad politisk styrt lokalt, da kan man få en situasjon at i et vannområde har man en filosofi og i et annet en annen".	HP producer
Political defensive response IMP	"I have as a start, very little trust to the County Council, and that's why it s a terribly dangerous strategy to put oneself on the sideline"	"Jeg har i utgangspunktet veldig liten tillit til fylkeskommunen, derfor er det en forferdelig farlig strategi og stille seg på sidelinjen"	HP producer
IMP Political response Context	"I find that the hydropower industry has been given a rather peripheral role. We're not part of any decision-making forum …as far as I know? It is a bit outside our control, and at the end of the day its about politics"	"Jeg synes jo at vannkraftbransjen har fått en litt periferrolle. Vi sitter jo såvidt jeg vet ikke sitter i noen besluttende fora ..?. Det er litt utenfor vår kontoll, og det er jo politisk til syvnde og sist. "	HP producer
WFD Industrial Context perception	"I am a firm believer that the concession system is good enough and that this [the WFD] we could have done without". You may sharpen the demands on how to evaluate things, but maybe the Directive and its short time horizons fits better in Europe than in Norway"	"Jeg har en grunnleggende tro på at konsesjonsystemet er godt nok, at dette hadde vi klart oss uten. Du kan godt skjerpe kravene til hvordan vurdere ting, men kanskje passer direktivet og de korte tidshorisontene bedre i Europa enn i Norge"	HP producer
Reactive Response Compliance	"The directive is something that the authorities need to deal with. We comply with what we are required to and initiate the measure that we need to."	«Direktive er et direktiv som myndighetene må forholde seg til. Vi oppfyller de forpliktelser vi skal, og setter inn de tiltak vi må sette inn»	HP producer
With reference to the current legislation Industry Context WFD	"It's very detailed for release of water and dates and so on. It is perhaps in the area the WFD should operate. Through the WFD knowledge is derived so that river basin can be operated in the most sensible way"	"Det er veldig detaljert for slipping av vann og datoer og så videre. Det er kanskje i det området vanndirektivet bør operere. Gjennom vanndirektivet så skaffer man kunnskap slik at vassdraget blir operert på en så fornuftig måte som mulig"	HP producer
Industry Context WFD	Yes we are very regulated, there are many limitations or conditions we have to deal with. It directs the projects we develop, taxation and revision and especially when this can be combined with the WFD "	"Ja vi blir jo veldig styrt, det er mange begrensninger eller rammebetingelser vi må forholde oss til. Det styrer hvilke prosjekter vi velger å bygge ut, beskatning og revisjon og særlig når dette kan kobles sammen med vanndirektivet"	HP producer
WFD Multi-leveled IMP	"Is it something new or is a new word for something of the same? We don't know this before it becomes more concrete. On an overall level it looks very new, but on the concrete level it looks pretty much like before….but so far I feel pretty unsure about it "	"Er det noe nytt eller er det nye ord for noe av det samme?" Det vet man ikke før man kommer ned på konkret nivå. På overorndet nivå så ser det veldig nytt ut, men på konkret nivå så ser det ganske likt ut… men foreløpig så føler jeg meg ganske usikker på det"	HP producer

Expressions and wordings that particular seemed to repeating itself themselves through the various interviews from different companies and actors in the HP industry. These are not meant to represent conclusive perceptions as such; they are included here in particular because it was difficult to find English expressions that give the exact same meaning.

Translated expression	**Original expression**	**Related to/With reference to**
'Highly regulated'	'Gjennomregulert'	The nature of the hydropower industry (production)
'Arbitrary treatment'	'Sjablongmessig behandling'	The rationale for appointing environmental measures to be taken in river basins, the way the Firms perceive that it sometimes is (e.g. measures not rooted in enough evidence or science in their view).
'Power struggle'	Maktkamp	The early process of deciding the responsible authority of the WFD, as a parts of the implementation process